

Genie®

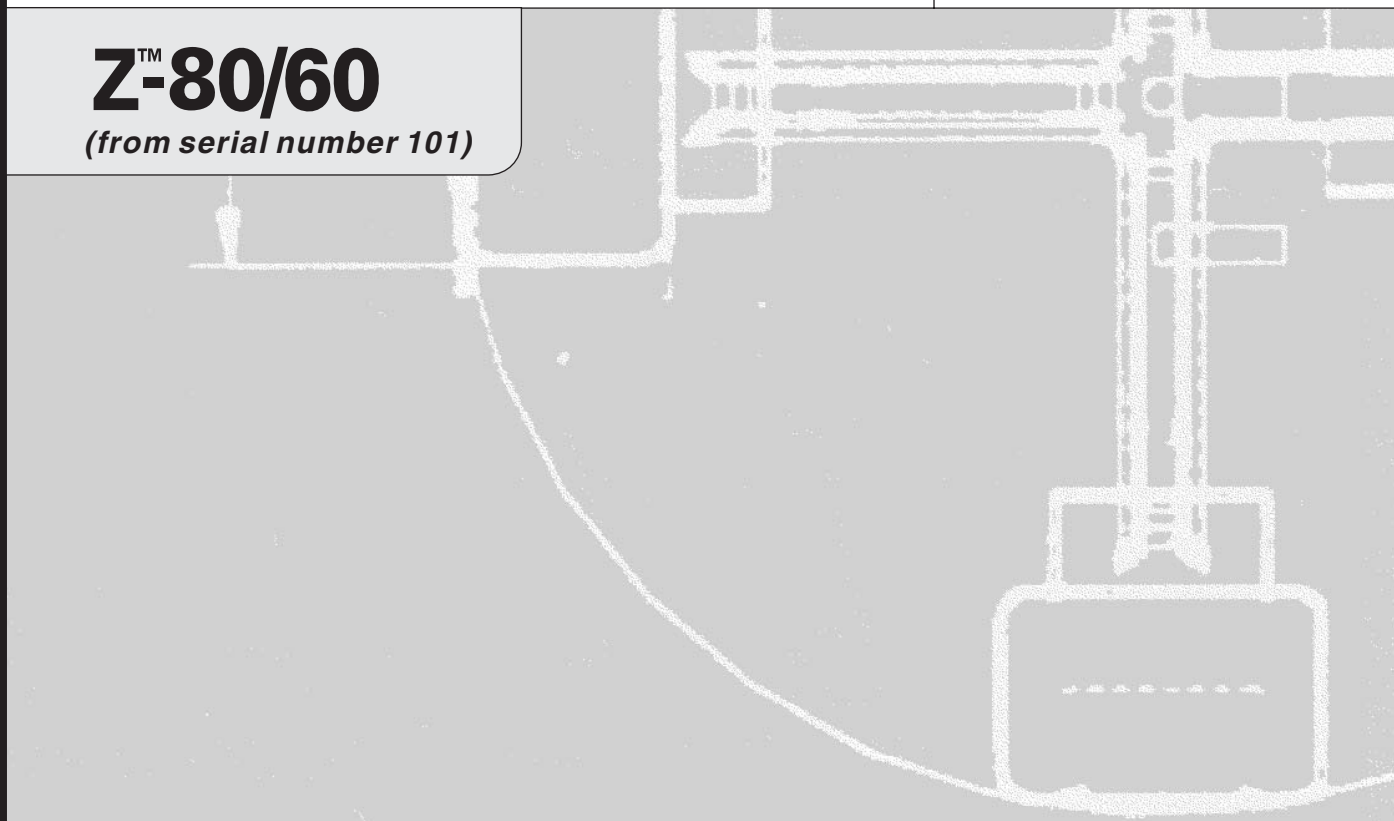
Service Manual



Part No. 88619
Rev B1
September 2006

ZTM-80/60

(from serial number 101)



Introduction

Important

Read, understand and obey the safety rules and operating instructions in the *Genie Z-80/60 Operator's Manual* before attempting any maintenance or repair procedure.

This manual provides detailed scheduled maintenance information for the machine owner and user. It also provides troubleshooting fault codes and repair procedures for qualified service professionals.

Basic mechanical, hydraulic and electrical skills are required to perform most procedures. However, several procedures require specialized skills, tools, lifting equipment and a suitable workshop. In these instances, we strongly recommend that maintenance and repair be performed at an authorized Genie dealer service center.

Technical Publications

Genie Industries has endeavored to deliver the highest degree of accuracy possible. However, continuous improvement of our products is a Genie policy. Therefore, product specifications are subject to change without notice.

Readers are encouraged to notify Genie of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this and all other manuals.

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88619 Rev B July 2006
First Edition, Second Printing

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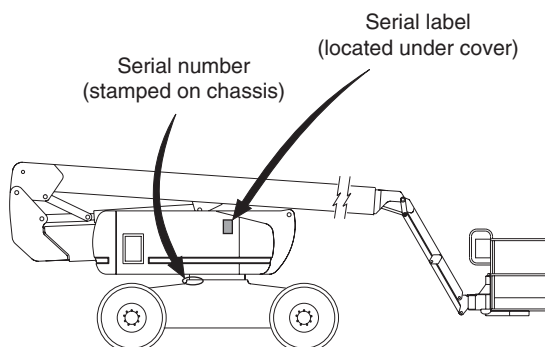
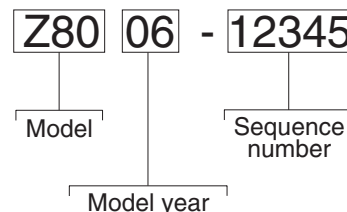
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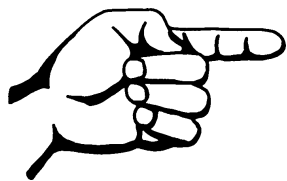

A TEREX COMPANY

Model: Z-80/60
Serial number: Z8006-12345
Model year: 2006 **Manufacture date:** 01/05/06
Electrical schematic number: ES0188
Machine unladen weight:

Rated work load (including occupants): 500 lb / 227 kg
Maximum number of platform occupants: 2
Maximum allowable side force : 150 lb / 670 N
Maximum allowable inclination of the chassis:
0 deg
Maximum wind speed : 28 mph/ 12.5 m/s
Maximum platform height : 86 ft/ 26.38 m
Maximum platform reach : 60 ft/ 18.28 m
Gradeability: N/A
Country of manufacture: USA
This machine complies with:
ANSI A92.5
CAN B.354.4

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Safety Rules



Danger

Failure to obey the instructions and safety rules in this manual, and the Operator's Manual will result in death or serious injury.

Many of the hazards identified in the operator's manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- ☒ You are trained and qualified to perform maintenance on this machine.
- ☒ You read, understand and obey:
 - manufacturer's instructions and safety rules
 - employer's safety rules and worksite regulations
 - applicable governmental regulations
- ☒ You have the appropriate tools, lifting equipment and a suitable workshop.

SAFETY RULES

Personal Safety

Any person working on or around a machine must be aware of all known safety hazards. Personal safety and the continued safe operation of the machine should be your top priority.



Read each procedure thoroughly. This manual and the decals on the machine use signal words to identify the following:



Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

▲ DANGER

Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

▲ WARNING

Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

▲ CAUTION

With safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

Without safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE

Used to indicate operation or maintenance information.



Be sure to wear protective eye wear and other protective clothing if the situation warrants it.



Be aware of potential crushing hazards such as moving parts, free swinging or unsecured components when lifting or placing loads. Always wear approved steel-toed shoes.

Workplace Safety

Be sure to keep sparks, flames and lighted tobacco away from flammable and combustible materials like battery gases and engine fuels. Always have an approved fire extinguisher within easy reach.



Be sure that all tools and working areas are properly maintained and ready for use. Keep work surfaces clean and free of debris that could get into machine components and cause damage.



Be sure any forklift, overhead crane or other lifting or supporting device is fully capable of supporting and stabilizing the weight to be lifted. Use only chains or straps that are in good condition and of ample capacity.



Be sure that fasteners intended for one time use (i.e., cotter pins and self-locking nuts) are not reused. These components may fail if they are used a second time.



Be sure to properly dispose of old oil or other fluids. Use an approved container. Please be environmentally safe.



Be sure that your workshop or work area is properly ventilated and well lit.

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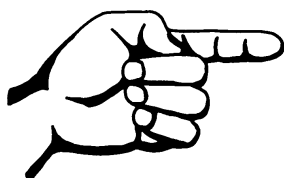
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REV C

Specifications

Machine Specifications

Tires and wheels

Tire size (foam filled, and non-marking)	18-625 FF
Tire size (Hi-flotation)	445D50/70
Tire ply rating (foam filled, and non-marking)	16
Tire ply rating (Hi-flotation)	14
Overall tire diameter (foam filled, and non-marking)	40.7 in 103.3 cm
Overall tire diameter (Hi-flotation)	45.47 in 115.5 cm
Wheel diameter (foam filled, and non-marking)	24.5 in 62.2 cm
Wheel diameter (Hi-flotation)	28 in 71.1 cm
Wheel width (foam filled, non-marking and Hi-flotation)	15 in 38.1 cm
Wheel lugs	10 @ $\frac{3}{4}$ -16
Lug nut torque, dry	420 ft-lbs 570 Nm
Lug nut torque, lubricated	320 ft-lbs 434 Nm

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

Fluid capacities

Fuel tank	40 gallons 151.4 liters
LPG tank	33.5 lbs 15.2 kg
Hydraulic tank	45 gallons 170 liters
Hydraulic system (including tank)	55 gallons 208 liters
Drive hubs	50.7 fl oz 1.5 liters
Turntable rotation drive hub	17 fl oz 0.5 liters
Drive hub oil type:	EP 80-90W gear oil API Service Classification GL5

For operational specification, refer to the Operator's Manual.

SPECIFICATIONS

REV C

Performance Specifications

**Drive speed, maximum
(models with rough terrain tires)**

Stowed position	3 mph
	4.8 km/h
	40 ft / 9.1 sec
	12.2 m / 9.1 sec

Raised or extended position	0.7 mph
	1.1 km/h
	40 ft / 40 sec
	12.2 m / 40 sec

**Drive speed, maximum
(models with Hi-flotation tires)**

Stowed position	2 mph
	3.1 km/h
	40 ft / 14 sec
	12.2 m / 14 sec

Raised or extended position	0.4 mph
	0.7 km/h
	40 ft / 66 sec
	12.2 m / 66 sec

Gradeability - Refer to Operator's Manual

Braking distance, maximum

High range on paved surface	3 ft
	90 cm

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REV C

SPECIFICATIONS

Function Speeds Specifications

Function speeds (factory settings)

Primary boom up, stowed (retracted -35° to 65°)	57 to 63 seconds
Primary boom down, stowed (retracted -35° to 65°)	50 to 56 seconds
Secondary boom up, stowed	60 to 70 seconds
Secondary boom down, stowed	60 to 70 seconds
Primary boom up, unstowed (-35° to 65°)	80 to 96 seconds
Primary boom down, unstowed (-35° to 65°)	80 to 96 seconds
Boom extend, stowed	48 to 52 seconds
Boom retract, stowed	38 to 42 seconds
Turntable rotate, 360° boom fully stowed	114 to 126 seconds
Turntable rotate, 360° boom unstowed	200 to 240 seconds

Boom function speeds, maximum from platform controls

Jib boom up	40 to 55 seconds
Jib boom down	40 to 55 seconds
Primary boom up	75 to 120 seconds
Primary boom down	75 to 120 seconds
Secondary boom up	120 to 180 seconds
Secondary boom down	120 to 180 seconds
Secondary boom extend	25 to 40 seconds
Secondary boom retract	25 to 40 seconds
Primary boom extend	32 to 45 seconds
Primary boom retract	32 to 45 seconds
Turntable rotate, 360° boom fully stowed	78 to 86 seconds
Turntable rotate, 360° boom raised or extended	165 to 185 seconds
Platform rotate, 160°	10 to 16 seconds

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SPECIFICATIONS

REV C

Hydraulic Specifications

Hydraulic Oil Specifications

Hydraulic oil type	Chevron Rykon MV equivalent
viscosity grade	Multi-viscosity
Viscosity index rating	200
Cleanliness level, minimum	15/13
Water content, maximum	200 ppm

Chevron Rykon MV oil is fully compatible and mixable with Shell Donax TG (Dexron III) oils.

Genie specifications require hydraulic oils which are designed to give maximum protection to hydraulic systems, have the ability to perform over a wide temperature range, and have a minimum viscosity index rating greater than 140. They should provide excellent antiwear, oxidation, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.

Optional fluids

Biodegradable	Petro Canada Environ MV46 Statoil Hydra Way Bio Pa 32 BP Biohyd SE-S
Fire resistant	UCON Hydrolube HP-5046 Quintolubric 822
Mineral based	Shell Tellus T32 Shell Tellus T46 Chevron Aviation 5606A

NOTICE Use Chevron Aviation A hydraulic oil when in ambient temperatures consistently below 0°F / -17°C

NOTICE Use Shell Tellus T46 hydraulic oil when in ambient temperatures consistently exceed 205°F / 96°C

NOTICE Genie specifications require additional equipment and special installation instructions for the approved optional fluids. Consult the Genie Industries Service Department before use.

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REV C

SPECIFICATIONS

Drive pump

Type: bi-directional variable displacement piston pump

Displacement	2.81 cu in 46 cc
--------------	---------------------

Flow rate @ 2300 rpm	28 gpm 106 L/min
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Drive pressure, maximum	3625 psi 250 bar
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Charge pump

Type: gerotor

Displacement	0.85 cu in 13.9 cc
--------------	-----------------------

Flow rate @ 2300 rpm	9 gpm 34 L/min
----------------------	-------------------

Charge pressure @ 2300 rpm	320 psi
Neutral position	22 bar

Function pumps

Type: two-section tandem gear pump

Displacement - Pump 1 (inner)	1.94 cu in 31.8 cc
-------------------------------	-----------------------

Flow rate @ 2300 rpm	17 gpm 64.4 L/min
----------------------	----------------------

Displacement - Pump 2 (outer)	0.58 cu in 9.5 cc
-------------------------------	----------------------

Flow rate @ 2300 rpm	5 gpm 19 L/min
----------------------	-------------------

Auxiliary pump

Type: two-section fixed displacement gear pump

Displacement - Section 1 (inner)	0.159 cu in 2.61 cc
----------------------------------	------------------------

Flow rate @ 2687 rpm	1.7 gpm 6.4 L/min
----------------------	----------------------

Displacement - Section 2 (outer)	0.051 cu in 0.84 cc
----------------------------------	------------------------

Flow rate @ 2687 rpm	0.3 gpm 1.1 L/min
----------------------	----------------------

Function manifold

System relief pressure (measured at P _{TEST} port)	3200 psi 220.6 bar
--	-----------------------

Primary boom down relief pressure (measured at P _{TEST} port)	1300 psi 89.6 bar
---	----------------------

Secondary boom down relief pressure (measured at P _{TEST} port)	2500 psi 172 bar
---	---------------------

Secondary boom up relief pressure (measured at P _{TEST} port)	2500 psi 172 bar
---	---------------------

Primary boom extend relief pressure (measured at P _{TEST} port)	1300 psi 89.6 bar
---	----------------------

Secondary boom extend relief pressure (measured at P _{TEST} port)	2600 psi 179 bar
---	---------------------

Platform manifold relief pressure	3000 psi 207 bar
-----------------------------------	---------------------

Platform manifold flow regulator	3 gpm 11.4 L/min
----------------------------------	---------------------

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SPECIFICATIONS

REV C

Oscillate manifold

Oscillate relief pressure (item GG)	800 psi 55.1 bar
-------------------------------------	---------------------

Platform manifold

Platform level flow regulator (item CH)	1 gpm 0.38 L/min
---	---------------------

Drive manifold

Hot oil relief pressure	280 psi 19.3 bar
-------------------------	---------------------

Brakes

Brake release pressure	215 psi 14.8 bar
------------------------	---------------------

Drive motors

Displacement per revolution, variable (2 speed motor)	0.9 to 2.7 cu in 14.7 to 45 cc
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Hydraulic tank return filter

High pressure filter	Beta ₃ ≥ 200
High pressure filter bypass pressure	102 psi 7 bar
Medium pressure filter	Beta ₃ ≥ 200
Medium pressure filter bypass pressure	51 psi 3.5 bar
Hydraulic tank return filter	10 micron with 25 psi / 1.7 bar bypass

Manifold Component Specifications**Plug torque**

SAE No. 2	50 in-lbs / 6 Nm
SAE No. 4	14 ft-lbs / 18.9 Nm
SAE No. 6	23 ft-lbs / 31.2 Nm
SAE No. 8	36 ft-lbs / 48.8 Nm
SAE No. 10	62 ft-lbs / 84.1 Nm
SAE No. 12	84 ft-lbs / 113.9 Nm

Valve coil resistance specifications

Proportional solenoid valve, 12V DC (schematic items G, R and BB)	4 to 6Ω
3 position 4 way solenoid valve, 12V DC (schematic items GB, GP and GQ)	4.5 to 6.5Ω
3 position 4 way solenoid valve, 10V DC (schematic items O, S, BA, BB, CA, CB, CP and CQ)	5 to 7Ω
2 position 2 way solenoid valve, 10V DC (schematic items C and P)	5.5 to 7.5Ω
2 position 3 way solenoid valve, 10V DC (schematic items H, J, V, X, Z, AA, BC, BD, CE, CF, EE, EF, FB and FC)	4.5 to 6.5Ω

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REV C

SPECIFICATIONS

GM 3.0L EFI Engine

Displacement	181 cu in 3 liters
Number of cylinders	4
Bore & stroke	4 x 3.6 inches 101.6 x 91.44 mm
Horsepower	
Intermittent	67 @ 2300 rpm 49 kW @ 2300 rpm
Continuous	60 @ 2300 rpm 45 kW @ 2300 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1650 rpm
Frequency	386.1 Hz
High idle	2300 rpm
Frequency	538.2 Hz
Compression ratio	9.25:1
Compression pressure - minimum	100 psi
Pressure (psi or bar) of lowest cylinder must be at least 75% of highest cylinder	
	6.9 bar
Valve clearances	Zero lash + 1 full turn
Lubrication system	
Oil pressure - minimum (operating temp. @ 2000 rpm)	18 psi 1.24 bar
Oil capacity (including filter)	5 quarts 4.7 liters
Oil viscosity requirements	
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.	

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Starter motor

Normal engine cranking speed	350 rpm
Current draw, normal load	400A
Current draw, maximum load	600A
Current draw, minimum	100A

Batteries

Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes

Electronic fuel pump

Fuel pressure, static	9 to 11 psi 0.6 to 0.76 bar
Fuel flow rate	0.3 gpm 1.14 L/min

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Ignition system

Spark plug type	AC ACMR-43-LTS
Spark plug gap	0.040 inch 1.01 mm

Engine coolant

Capacity	12 quarts 11.4 liters
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Alternator

Output	66A, 12V DC
Fan belt deflection	0.5 inch 12 mm

SPECIFICATIONS

REV C

Ford LRG-425 EFI Engine

Displacement	153 cu in 2.5 liters
---------------------	-------------------------

Number of cylinders	4
----------------------------	---

Bore & stroke	3.78 x 3.4 in 96.01 x 86.36 mm
--------------------------	-----------------------------------

Horsepower

Continuous	60 @ 2500 rpm 44.7 kW @ 2500 rpm
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Intermittent	70 @ 2500 rpm 52 kW @ 2500 rpm
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Firing order	1 - 3 - 4 - 2
---------------------	---------------

Low idle	1600 rpm
Frequency	396.8 Hz

High idle	2500 rpm
Frequency	620 Hz

Compression ratio	9.4:1
--------------------------	-------

Compression pressure (approx.)

Pressure (psi or bar) of lowest cylinder must be at least 75% of highest cylinder.

Valve clearances - collapsed tappet	0.035 to 0.055 in 0.889 to 1.397 mm
--	--

Lubrication system

Oil pressure (operating temp. @ 2000 rpm)	40 to 60 psi 2.75 to 4.1 bar
--	---------------------------------

Oil capacity (including filter)	5 quarts 4.7 liters
------------------------------------	------------------------

Oil viscosity requirements

Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

Oil pressure switch specifications

Torque	8-18 ft-lbs 11-24 Nm
--------	-------------------------

Oil pressure switch point	3-5 psi 0.21-0.34 bar
---------------------------	--------------------------

Starter motor

Normal engine cranking speed	200 to 250 rpm
------------------------------	----------------

Current draw, normal load	140-200A
---------------------------	----------

Current draw, maximum load	800A
----------------------------	------

Current draw, no load	70A
-----------------------	-----

Maximum circuit voltage drop while starting (normal temperature)	0.5V DC
--	---------

Battery

Type	12V DC
------	--------

Group	34/78
-------	-------

Quantity	1
----------	---

Cold cranking ampere	900A
----------------------	------

Reserve capacity @ 25A rate	200 minutes
-----------------------------	-------------

Electronic fuel pump

Fuel pressure, static	64 psi 4.4 bar
-----------------------	-------------------

Fuel flow rate	0.58 gpm 2.18 L/min
----------------	------------------------

Fuel requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Ignition system

Spark plug type	Motorcraft AWSF-52C
-----------------	---------------------

Spark plug gap	0.042 to 0.046 in 1.07 to 1.18 mm
----------------	--------------------------------------

Spark plug torque	5 to 10 ft-lbs 7 to 14 Nm
-------------------	------------------------------

REV C

SPECIFICATIONS

Engine coolant

Capacity	11.5 quarts 10.9 liters
----------	----------------------------

Coolant temperature switch

Torque	8-18 ft-lbs 11-24 Nm
--------	-------------------------

Temperature switch point	230° F 112° C
--------------------------	------------------

Alternator

Output	95A, 13.8V DC
--------	---------------

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

REV C

Deutz F4L- 913 Engine

Displacement	249.3 cu in 4.085 liters
---------------------	-----------------------------

Number of cylinders	4
----------------------------	---

Bore and stroke	4.02 x 4.92 inches 102.1 x 125 mm
------------------------	--------------------------------------

Horsepower	76 @ 2300 rpm 56.6 kW @ 2300 rpm
-------------------	-------------------------------------

Firing order	1 - 3 - 4 - 2
---------------------	---------------

Compression ratio	18:1
--------------------------	------

Compression pressure

Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder.

Low idle - no load	1300 rpm
Frequency	385.7 Hz

High idle - no load	2300 rpm
Frequency	570.4 Hz

Valve clearance, cold

Intake	0.006 in 0.15 mm
--------	---------------------

Exhaust	0.006 in 0.15 mm
---------	---------------------

Lubrication system

Oil pressure	40 to 60 psi 2.75 to 4.14 bar
--------------	----------------------------------

Oil capacity (including filter)	14.3 quarts 13.5 liters
------------------------------------	----------------------------

Oil viscosity requirements

Units ship with 15W-40.

Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Injection system

Injection pump make	IMSA
---------------------	------

Injection pump pressure	8702 psi 600 bar
-------------------------	---------------------

Injector opening pressure	3626 psi 250 bar
---------------------------	---------------------

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Batteries

Type	12V DC
------	--------

Group	31
-------	----

Quantity	2
----------	---

Cold cranking ampere	1000A
----------------------	-------

Reserve capacity @ 25A rate	200 minutes
-----------------------------	-------------

Alternator output	55A, 12V DC
--------------------------	-------------

Fan belt deflection	$\frac{3}{8}$ to $\frac{1}{2}$ inch 9 to 12 mm
----------------------------	---

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

REV C

SPECIFICATIONS

Deutz BF4L-2011 Engine

Displacement	189.6 cu in 3.1 liters
Number of cylinders	4
Bore and stroke	3.7 x 4.409 inches 94 x 112 mm
Horsepower	
Continuous	69.1 @ 2500 rpm 51.5 kW @ 2500 rpm
Net intermittent	72.8 @ 2500 rpm 54.3 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1500 rpm
Frequency	372 Hz
High idle	2350 rpm
Frequency	582.8 Hz
Compression ratio	17.5:1
Compression pressure	
Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder.	
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.012 in 0.3 mm
Exhaust	0.020 in 0.5 mm

Lubrication system

Oil pressure, hot (at 2000 rpm)	40 to 60 psi 2.8 to 4.1 bar
------------------------------------	--------------------------------

Oil capacity (including filter)	11 quarts 10.4 liters
------------------------------------	--------------------------

Oil viscosity requirements

Units ship with 15W-40.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Oil temperature switch

Torque	8-18 ft-lbs 11-24 Nm
--------	-------------------------

Oil temperature switch point	275°F 135°C
------------------------------	----------------

Oil pressure switch

Torque	8-18 ft-lbs 11-24 Nm
--------	-------------------------

Oil pressure switch point	7 psi 0.48 bar
---------------------------	-------------------

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

REV C

Fuel injection system

Injection pump make	Bosch
Injection pump pressure, maximum	15,000 psi 1034 bar
Injector opening pressure	3046 psi 210 bar

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Starter motor

Current draw, normal load	140-200A
Cranking speed	200-250 rpm

Battery - Engine starting and control system

Type	12V DC, Group 31
Quantity	2
Cold cranking ampere	1000
Reserve capacity @ 25A rate	200 minutes

Alternator output	80A @ 14V DC
--------------------------	--------------

Fan belt deflection	$\frac{3}{8}$ to $\frac{1}{2}$ inch 9 to 12 mm
----------------------------	---

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

REV C

SPECIFICATIONS

Perkins 704-30 Engine

Displacement	183 cu in 3 liters
Number of cylinders	4
Bore and stroke	3.82 x 3.94 inches 97 x 100 mm
Horsepower	61 @ 2300 rpm 45.5 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	17.5:1
Compression pressure	300 to 500 psi 20.7 to 34.5 bar
Pressure (psi or bar) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder	
Low idle	1600 rpm
Frequency	246.7 Hz
High idle	2300 rpm
Frequency	385.4 Hz
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.014 in 0.35 mm
Exhaust	0.014 in 0.35 mm
Lubrication system	
Oil pressure @ 2300 rpm	41 psi 2.8 bar
Oil capacity (including filter)	7.4 quarts 7 liters

Oil viscosity requirements

Units ship with 15W-40.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Injection system

Injection pump make	Zexel PFR-KX
Injection pump pressure	2755 psi 190 bar
Injector opening pressure	3626 psi 250 bar

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Engine coolant

Capacity	11.5 quarts 10.9 liters
----------	----------------------------

Batteries

Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes

Alternator output	65A, 12V DC
--------------------------	-------------

Fan belt deflection	$\frac{3}{8}$ in 10 mm
----------------------------	---------------------------

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

REV C

Perkins 804C-33 Engine

Displacement	201 cu in 3.3 liters
Number of cylinders	4
Bore and stroke	3.70 x 4.72 inches 94 x 120 mm
Horsepower	63 @ 2600 rpm 47 kW @ 2600 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	22:1
Compression pressure	300 to 500 psi 20.7 to 34.5 bar
Pressure (psi or bar) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder	
Low idle	1650 rpm
Frequency	335.5 Hz
High idle	2300 rpm
Frequency	467.7 Hz
Governor	mechanical all speed
Valve clearance, cold	
Intake	0.0098 in 0.25 mm
Exhaust	0.0098 in 0.25 mm
Lubrication system	
Oil pressure @ 2000 rpm	40-60 psi 2.8-4.1 bar
Oil capacity (including filter)	10.6 quarts 10 liters

Oil viscosity requirements

Units ship with 15W-40.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Injection system

Injection pump make	Zexel 10641-3932
Injection pump pressure	1707 to 1849 psi 117.7 to 127.5 bar
Injector opening pressure	~2000 psi ~138 bar

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Engine coolant

Capacity	12.5 quarts 11.8 liters
----------	----------------------------

Batteries

Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes

Alternator output	90A, 12V DC
--------------------------	-------------

Fan belt deflection	$\frac{3}{8}$ to $\frac{1}{2}$ in 9 to 12 mm
----------------------------	---

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

REV C

SPECIFICATIONS

Machine Torque Specifications

Platform rotator

1-8 center bolt, Gr 5, dry	640 ft-lbs 867 Nm
----------------------------	----------------------

3/8 -16 bolts, Gr 8 *(use blue thread locking compound)	35 ft-lbs* 47.5 Nm*
--	------------------------

Turntable rotate assembly

Rotate bearing mounting bolts, lubricated	180 ft-lbs 244 Nm
---	----------------------

Rotate drive hub mounting bolts, lubricated	80 ft-lbs 108.4 Nm
---	-----------------------

Backlash plate mounting bolts, lubricated	280 ft-lbs 379 Nm
---	----------------------

Drive motor and hubs

Drive hub mounting bolts, dry	210 ft-lbs 284 Nm
-------------------------------	----------------------

Drive hub mounting bolts, lubricated	160 ft-lbs 217 Nm
--------------------------------------	----------------------

Drive motor mounting bolts, dry	110 ft-lbs 149 Nm
---------------------------------	----------------------

Drive motor mounting bolts, lubricated	80 ft-lbs 108.4 Nm
--	-----------------------

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

Manifold Component Specifications

Plug torque

SAE No. 2	50 in-lbs / 6 Nm
-----------	------------------

SAE No. 4	14 ft-lbs / 18.9 Nm
-----------	---------------------

SAE No. 6	23 ft-lbs / 31.2 Nm
-----------	---------------------

SAE No. 8	36 ft-lbs / 48.8 Nm
-----------	---------------------

SAE No. 10	62 ft-lbs / 84.1 Nm
------------	---------------------

SAE No. 12	84 ft-lbs / 113.9 Nm
------------	----------------------

SPECIFICATIONS

REV C

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok® fittings and hose ends. Genie specifications require that fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

SAE O-ring Boss Port

(tube fitting - installed into Aluminum)

SAE Dash size	Torque
-4	14 ft-lbs / 18.9 Nm
-6	23 ft-lbs / 31.2 Nm
-8	36 ft-lbs / 48.8 Nm
-10	62 ft-lbs / 84.1 Nm
-12	84 ft-lbs / 113.9 Nm
-16	125 ft-lbs / 169.5 Nm
-20	151 ft-lbs / 204.7 Nm
-24	184 ft-lbs / 250 Nm

SAE O-ring Boss Port

(tube fitting - installed into Steel)

SAE Dash size	Torque
-4	15 ft-lbs / 20.3 Nm
-6	35 ft-lbs / 47.5 Nm
-8	60 ft-lbs / 81.3 Nm
-10	100 ft-lbs / 135.6 Nm
-12	135 ft-lbs / 183 Nm
-16	200 ft-lbs / 271 Nm
-20	250 ft-lbs / 334 Nm
-24	305 ft-lbs / 414 Nm

Seal-Lok® fittings

- 1 Replace the O-ring. The O-ring must be replaced anytime the seal has been broken. The O-ring cannot be re-used if the fitting or hose end has been tightened beyond finger tight.

NOTICE

The O-rings used in the Parker Seal Lok® fittings and hose ends are custom-size O-rings. They are not standard SAE size O-rings. They are available in the O-ring field service kit (Genie part number 49612).

- 2 Lubricate the O-ring before installation.
- 3 Be sure that the face seal O-ring is seated and retained properly.
- 4 Position the tube and nut squarely on the face seal end of the fitting and tighten the nut finger tight.
- 5 Tighten the nut or fitting to the appropriate torque per given size as shown in the table.
- 6 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

Seal-Lok® Fittings

(hose end)

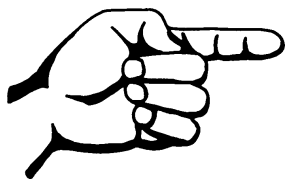
SAE Dash size	Torque
-4	18 ft-lbs / 24.4 Nm
-6	30 ft-lbs / 40 Nm
-8	40 ft-lbs / 55 Nm
-10	60 ft-lbs / 80 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	140 ft-lbs / 190 Nm
-24	180 ft-lbs / 245 Nm

REV C

SPECIFICATIONS

SAE FASTENER TORQUE CHART											
• This chart is to be used as a guide only unless noted elsewhere in this manual •											
SIZE	THREAD	Grade 5 				Grade 8 				A574 High Strength Black Oxide Bolts	
		LUBED		DRY		LUBED		DRY		LUBED	
		in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/4	20	100	11.3	80	9	140	15.8	110	12.4	130	14.7
	28	90	10.1	120	13.5	120	13.5	160	18	140	15.8
		LUBED		DRY		LUBED		DRY		LUBED	
		ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
5/16	18	13	17.6	17	23	18	24	25	33.9	21	28.4
	24	14	19	19	25.7	20	27.1	27	36.6	24	32.5
3/8	16	23	31.2	31	42	33	44.7	44	59.6	38	51.5
	24	26	35.2	35	47.4	37	50.1	49	66.4	43	58.3
7/16	14	37	50.1	49	66.4	50	67.8	70	94.7	61	82.7
	20	41	55.5	55	74.5	60	81.3	80	108.4	68	92.1
1/2	13	57	77.3	75	101.6	80	108.4	110	149	93	126
	20	64	86.7	85	115	90	122	120	162	105	142
9/16	12	80	108.4	110	149	120	162	150	203	130	176
	18	90	122	120	162	130	176	170	230	140	189
5/8	11	110	149	150	203	160	217	210	284	180	244
	18	130	176	170	230	180	244	240	325	200	271
3/4	10	200	271	270	366	280	379	380	515	320	433
	16	220	298	300	406	310	420	420	569	350	474
7/8	9	320	433	430	583	450	610	610	827	510	691
	14	350	474	470	637	500	678	670	908	560	759
1	8	480	650	640	867	680	922	910	1233	770	1044
	12	530	718	710	962	750	1016	990	1342	840	1139
1 1/8	7	590	800	790	1071	970	1315	1290	1749	1090	1477
	12	670	908	890	1206	1080	1464	1440	1952	1220	1654
1 1/4	7	840	1138	1120	1518	1360	1844	1820	2467	1530	2074
	12	930	1260	1240	1681	1510	2047	2010	2725	1700	2304
1 1/2	6	1460	1979	1950	2643	2370	3213	3160	4284	2670	3620
	12	1640	2223	2190	2969	2670	3620	3560	4826	3000	4067

METRIC FASTENER TORQUE CHART																
• This chart is to be used as a guide only unless noted elsewhere in this manual •																
Size (mm)	Class 4.6 				Class 8.8 				Class 10.9 				Class 12.9 			
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
5	16	1.8	21	2.4	41	4.63	54	6.18	58	6.63	78	8.84	68	7.75	91	10.3
6	19	3.05	36	4.07	69	7.87	93	10.5	100	11.3	132	15	116	13.2	155	17.6
7	45	5.12	60	6.83	116	13.2	155	17.6	167	18.9	223	25.2	1.95	22.1	260	29.4
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
8	5.4	7.41	7.2	9.88	14	19.1	18.8	25.5	20.1	27.3	26.9	36.5	23.6	32	31.4	42.6
10	10.8	14.7	14.4	19.6	27.9	37.8	37.2	50.5	39.9	54.1	53.2	72.2	46.7	63.3	62.3	84.4
12	18.9	25.6	25.1	34.1	48.6	66	64.9	88	69.7	94.5	92.2	125	81	110	108	147
14	30.1	40.8	40	54.3	77.4	105	103	140	110	150	147	200	129	175	172	234
16	46.9	63.6	62.5	84.8	125	170	166	226	173	235	230	313	202	274	269	365
18	64.5	87.5	86.2	117	171	233	229	311	238	323	317	430	278	377	371	503
20	91	124	121	165	243	330	325	441	337	458	450	610	394	535	525	713
22	124	169	166	225	331	450	442	600	458	622	612	830	536	727	715	970
24	157	214	210	285	420	570	562	762	583	791	778	1055	682	925	909	1233



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Scheduled Maintenance Procedures



Observe and Obey:

- ☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- ☑ Scheduled maintenance inspections shall be completed daily, quarterly, six months, annually and every two years as specified on the *Maintenance Inspection Report*.

⚠ WARNING Failure to perform each procedure as presented and scheduled could result in death, serious injury or substantial machine damage.

- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating machine.
- ☑ Keep records on all inspections for three years.
- ☑ Unless otherwise specified, perform each procedure with the machine in the following configuration:
 - Machine parked on a firm, level surface
 - Boom in the stowed position
 - Turntable rotated with the boom between the circle-end (yellow arrow) wheels
 - Turntable secured with the turntable rotation lock pin
 - Key switch in the off position with the key removed
 - Wheels chocked
 - All external AC power supply disconnected from the machine

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

Each procedure includes a description, safety warnings and step-by-step instructions.

Symbols Legend



Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

Without safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE

Used to indicate operation or maintenance information.

- ⦿ Indicates that a specific result is expected after performing a series of steps.
- ✗ Indicates that an incorrect result has occurred after performing a series of steps.

SCHEDULED MAINTENANCE PROCEDURES

REV B

Maintenance Symbols Legend**NOTICE**

The following symbols have been used in this manual to help communicate the intent of the instructions. When one or more of the symbols appear at the beginning of a maintenance procedure, it conveys the meaning below.



Indicates that tools will be required to perform this procedure.



Indicates that new parts will be required to perform this procedure.



Indicates that a cold engine will be required to perform this procedure.



Indicates that a warm engine will be required to perform this procedure.



Indicates that dealer service is required to perform this procedure.

Pre-delivery Preparation Report

The pre-delivery preparation report contains checklists for each type of scheduled inspection.

Make copies of the *Pre-delivery Preparation* report to use for each inspection. Store completed forms as required.

Maintenance Schedule

There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, six months, annual, and two years. The *Scheduled Maintenance Procedures Section* and the *Maintenance Inspection Report* have been divided into five subsections—A, B, C, D and E. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

Inspection	Checklist
Daily or every 8 hours	A
Quarterly or every 250 hours	A + B
Six months or every 500 hours	A + B + C
Annual or every 1000 hours	A + B + C + D
Two years or every 2000 hours	A + B + C + D + E

Maintenance Inspection Report

The maintenance inspection report contains checklists for each type of scheduled inspection.

Make copies of the *Maintenance Inspection Report* to use for each inspection. Store completed forms for three years.

Pre-Delivery Preparation

Fundamentals

It is the responsibility of the dealer to perform the Pre-delivery Preparation.

The Pre-delivery Preparation is performed prior to each delivery. The inspection is designed to discover if anything is apparently wrong with a machine before it is put into service.

A damaged or modified machine must never be used. If damage or any variation from factory delivered condition is discovered, the machine must be tagged and removed from service.

Repairs to the machine may only be made by a qualified service technician, according to the manufacturer's specifications.

Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications and the requirements listed in the responsibilities manual.

Instructions

Use the operator's manual on your machine.

The Pre-delivery Preparation consists of completing the Pre-operation Inspection, the Maintenance items and the Function Tests.

Use this form to record the results. Place a check in the appropriate box after each part is completed. Follow the instructions in the operator's manual.

If any inspection receives an N, remove the machine from service, repair and re-inspect it. After repair, place a check in the R box.

Legend

Y = yes, completed

N = no, unable to complete

R = repaired

Comments

Pre-Delivery Preparation	Y	N	R
Pre-operation inspection completed			
Maintenance items completed			
Function tests completed			

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

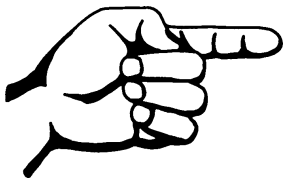
Inspector title

Inspector company



Genie Industries USA
18340 NE 76th Street
PO Box 97030
Redmond, WA 98073-9730
(425) 881-1800

Genie UK
The Maltings, Wharf Road
Grantham, Lincolnshire
NG31-6BH England
(44) 1476-584333



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Maintenance Inspection Report

Model
Serial number
Date
Hour meter
Machine owner
Inspected by (print)
Inspector signature
Inspector title
Inspector company

Instructions

- Make copies of this report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

☐	Daily or 8 hour Inspection:	A
☐	Quarterly or 250 hour Inspection:	A+B
☐	Six Month or 500 hour Inspection:	A+B+C
☐	Annual or 1000 hours Inspection:	A+B+C+D
☐	2 Year or 2000 hour Inspection:	A+B+C+D+E

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section to learn how to perform these inspections.
- If any inspection receives an "N", tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the "R" box.

Legend

Y = yes, acceptable
 N = no, remove from service
 R = repaired

Checklist A - Rev C		Y	N	R
A-1	Inspect the manuals and decals			
A-2	Pre-operation inspection			
A-3	Function tests			
A-4	Engine maintenance			
A-5	Hydraulic filter condition indicators			
Perform after 40 hours:				
A-6	30 Day Service			
Perform every 100 hours:				
A-7	Engine maintenance			
A-8	Rotation bearing			
A-9	Filter/separator			
Perform every 125 hours:				
A-10	Engine maintenance			
Perform after 150 hours:				
A-11	Replace drive hub oil			
Perform every 200 hours:				
A-12	Engine maintenance			

Checklist B - Rev B		Y	N	R
B-1	Batteries			
B-2	Electrical wiring			
B-3	Key switch			
B-4	Exhaust system			
B-5	Engine Air Filter			
B-6	Engine maintenance			
B-7	Lug nut torque			
B-8	Brake configuration			
B-9	Drive hub maintenance			
B-10	Ground control override			
B-11	Platform self leveling			
B-12	Engine idle select			
B-13	Fuel select operation			
B-14	Drive brakes			
B-15	Drive speed - stowed			
B-16	Drive speed - raised or extended			
B-17	Alarm and beacon			
B-18	Hydraulic oil analysis			
B-19	Engine RPM			
B-20	Safety envelope and circuits			
B-21	Primary boom self-leveling			
B-22	Primary boom angle sensor			
B-23	Fuel and hydraulic tank cap venting system			
B-24	Engine maintenance			
Perform every 400 hours:				
B-25	Engine maintenance			

Comments

MAINTENANCE INSPECTION REPORT

Model
Serial number
Date
Hour meter
Machine owner
Inspected by (print)
Inspector signature
Inspector title
Inspector company

Instructions

- Make copies of this report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

☐	Daily or 8 hour Inspection:	A
☐	Quarterly or 250 hour Inspection:	A+B
☐	Six Month or 500 hour Inspection:	A+B+C
☐	Annual or 1000 hours Inspection:	A+B+C+D
☐	2 Year or 2000 hour Inspection:	A+B+C+D+E

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section to learn how to perform these inspections.
- If any inspection receives an "N", tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the "R" box.

Legend

Y = yes, acceptable
 N = no, remove from service
 R = repaired

Checklist C - Rev B		Y	N	R
C-1	Engine maintenance			
C-2	Grease platform overload (if equipped)			
C-3	Test the platform overload (if equipped)			
C-4	Engine Air Filter			
C-5	Replace filter/separator			
Perform every 800 hours:				
C-6	Engine maintenance			

Checklist D - Rev B		Y	N	R
D-1	Boom wear pads			
D-2	Free-wheel configuration			
D-3	Turntable rotation bolts			
D-4	Turntable bearing wear			
D-5	Drive hub oil			
D-6	Engine maintenance			
Perform every 1000 hours:				
D-7	Replace hydraulic filters			

Comments

Checklist E - Rev B		Y	N	R
E-1	Replace hydraulic oil			
E-2	Wheel bearings, 2WD models			
E-3	Engine maintenance			
Perform every 2400 hours:				
E-4	Engine maintenance			
Perform every 3000 hours:				
E-5	Engine maintenance			
Perform every 5000 hours:				
E-6	Engine maintenance			
Perform every 6000 hours:				
E-7	Engine maintenance			
Perform every 12000 hours:				
E-8	Engine maintenance			

REV C

Checklist A Procedures

A-1

Inspect the Manuals and Decals

Maintaining the operator's and safety manuals in good condition is essential to safe machine operation. Manuals are included with each machine and should be stored in the container provided in the platform. An illegible or missing manual will not provide safety and operational information necessary for a safe operating condition.

In addition, maintaining all of the safety and instructional decals in good condition is mandatory for safe machine operation. Decals alert operators and personnel to the many possible hazards associated with using this machine. They also provide users with operation and maintenance information. An illegible decal will fail to alert personnel of a procedure or hazard and could result in unsafe operating conditions.

- 1 Check to make sure that the operator's and safety manuals are present and complete in the storage container on the platform.
 - 2 Examine the pages of each manual to be sure that they are legible and in good condition.
- ⦿ Result: The operator's manual is appropriate for the machine and all manuals are legible and in good condition.
 - ✗ Result: The operator's manual is not appropriate for the machine or all manuals are not in good condition or is illegible. Remove the machine from service until the manual is replaced.

- 3 Open the operator's manual to the decals inspection section. Carefully and thoroughly inspect all decals on the machine for legibility and damage.
- ⦿ Result: The machine is equipped with all required decals, and all decals are legible and in good condition.
- ✗ Result: The machine is not equipped with all required decals, or one or more decals are illegible or in poor condition. Remove the machine from service until the decals are replaced.
- 4 Always return the manuals to the storage container after use.

NOTICE

Contact your authorized Genie distributor or Genie Industries if replacement manuals or decals are needed.

CHECKLIST A PROCEDURES

REV C

A-2**Perform Pre-operation Inspection**

Completing a pre-operation inspection is essential to safe machine operation. The pre-operation inspection is a visual inspection performed by the operator prior to each work shift. The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests. The pre-operation inspection also serves to determine if routine maintenance procedures are required.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

A-3**Perform Function Tests**

Completing the function tests is essential to safe machine operation. Function tests are designed to discover any malfunctions before the machine is put into service. A malfunctioning machine must never be used. If malfunctions are discovered, the machine must be tagged and removed from service.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

REV C

CHECKLIST A PROCEDURES

A-4

Perform Engine Maintenance



NOTICE

Engine specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz 913 Operation Manual

Genie part number 62446

Deutz BF4L2011 Operation Manual

Genie part number 84794

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook

Genie part number 77738

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook

Genie part number 101840

Perkins 804C-33 Operation and Maintenance Manual

Genie part number 111332

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook

Genie part number 84792

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST A PROCEDURES

REV C

A-5**Check the Hydraulic Filter
Condition Indicators**

Maintaining the hydraulic filters in good condition is essential to good system performance and safe machine operation. The filter condition indicators will show when the hydraulic flow is bypassing a clogged filter. If the filters are not frequently checked and replaced, impurities will remain in the hydraulic system and cause component damage.

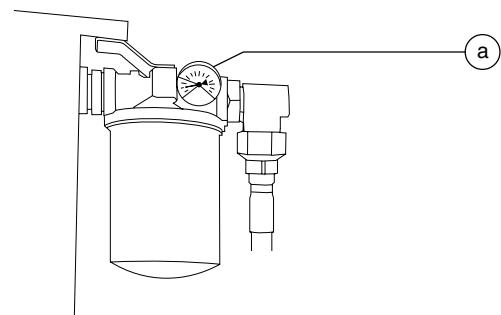
NOTICE

There are four hydraulic filters on the machine: one tank return filter, one medium pressure filter and two high pressure filters. All the filters have condition indicators on them, except the medium pressure filter.

- 1 Start the engine from the ground controls.
- 2 Press and release the engine idle select button to change the engine rpm to high idle.

Tank return filter

- 3 Open the ground control side turntable cover and inspect the filter condition indicator gauge.
- ⊙ Result: The needle on the gauge should be operating in the green area. If the needle is in the red area, this indicates that the hydraulic filter is being bypassed and the filter needs to be replaced. See D-7, *Replace the Hydraulic Filter Elements*.



a filter condition indicator gauge

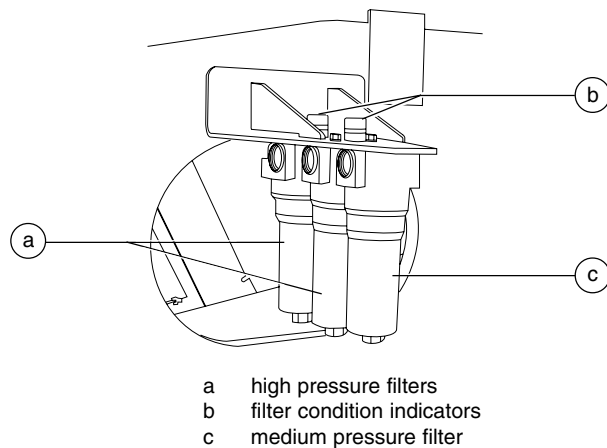
REV C

CHECKLIST A PROCEDURES

Medium and high pressure filters

NOTICE The medium and high pressure filters are mounted to the engine side bulkhead.

- 4 Inspect the filter condition indicators.



- ⊙ **Result:** The filter condition indicators should be operating with the plungers in the green area. If any of the indicators display the plunger in the red area, this indicates that a hydraulic filter is being bypassed and the filter needs to be replaced. See D-7, *Replace the Hydraulic Filter Elements*.

A-6**Perform 30 Day Service**

The 30 day maintenance procedure is a one time sequence of procedures to be performed after the first 30 days or 40 hours of usage. After this interval, refer to the maintenance checklists for continued scheduled maintenance.

- 1 Perform the following maintenance procedures:

- A-8 Grease the Turntable Rotation Bearing and Rotate Gear
- B-7 Check the Tires, Wheels and Lug Nut Torque
- B-9 Check the Drive Hub Oil Level and Fastener Torque
- B-24 Perform Engine Maintenance
- C-6 Perform Engine Maintenance - Gasoline/LPG Models
- D-3 Check the Turntable Rotation Bearing Bolts
- D-6 Perform Engine Maintenance - Diesel Models
- D-7 Replace the Hydraulic Filter Elements

CHECKLIST A PROCEDURES

REV C

A-7**Perform Engine Maintenance****NOTICE**

Engine specifications require that this procedure be performed every 100 hours.

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook

Genie part number 77738

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook

Genie part number 101840

Perkins 804C-33 Operation and Maintenance Manual

Genie part number 111332

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook

Genie part number 84792

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

REV C

CHECKLIST A PROCEDURES

A-8 Grease the Turntable Rotation Bearing and Rotate Gear



NOTICE

Genie specifications require that this procedure be performed every 100 hours of operation. Perform this procedure more often if dusty conditions exist.

Frequent application of lubrication to the turntable bearing and rotate gear is essential to good machine performance and service life. Continued use of an improperly greased bearing and gear will result in component damage.

- 1 Locate the grease fitting next to the ground control box.
- 2 Pump grease into the turntable rotation bearing. Rotate the turntable in increments of 4 to 5 inches / 10 to 13 cm at a time and repeat this step until the entire bearing has been greased.
- 3 Apply grease to each tooth of the drive gear, located under the turntable.

Grease Specification

Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

A-9 Inspect the Fuel Filter/Water Separator - Diesel Models



NOTICE

Genie specifications require that this procedure be performed every 100 hours or monthly, whichever comes first.

Proper maintenance of the fuel filter/water separator is essential for good engine performance. Failure to perform this procedure can lead to poor engine performance and/or hard starting, and continued use may result in component damage. Extremely dirty conditions may require this procedure be performed more often.

⚠ DANGER

Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

NOTICE

Perform this procedure with the engine off.

- 1 Open the turntable cover at the engine side of the machine. Locate the fuel filter/water separator.

CHECKLIST A PROCEDURES

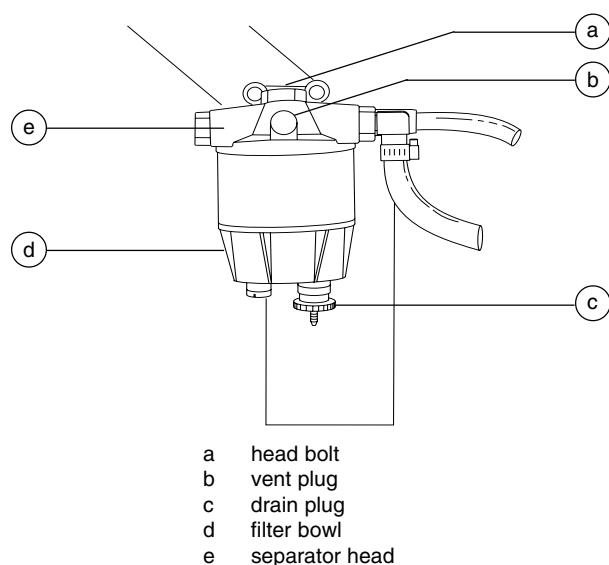
REV C

2 Inspect the filter bowl for water.

☉ Result: Water is not visible in the filter bowl.

☒ Result: There is water present. Proceed to step 3.

3 Loosen the vent plug located on the head of the fuel filter/water separator.



4 Loosen the drain plug located at the bottom of the bowl. Allow the water to drain into a suitable container until fuel starts to come out. Immediately tighten the drain plug.

5 Clean up any fuel that may have spilled.

NOTICE

If the fuel filter/water separator is completely drained, you must prime the fuel filter/water separator before starting the engine. See C-5, *Replace The Fuel Filter/Water Separator Element*, for instructions on how to prime the fuel filter/water separator.

6 Start the engine from the ground controls and check the fuel filter/water separator and vent plug for leaks.

⚠ DANGER

Explosion and fire hazard. If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

REV C

CHECKLIST A PROCEDURES

A-10 Perform Engine Maintenance - Deutz Models



NOTICE

Engine specifications require that this procedure be performed every 125 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341).

Deutz 913 Operation Manual

Genie part number

62446

A-11 Replace the Drive Hub Oil



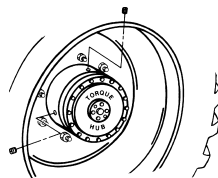
NOTICE

Manufacturer drive hub specifications require that this one-time procedure be performed after the first 150 hours.

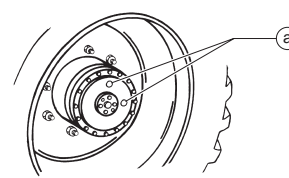
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the torque hub oil after the first 150 hours of use may cause the machine to perform poorly and continued use may cause component damage.

Drive Hubs:

- 1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.
- 2 Remove both plugs and drain the oil into a suitable container.
- 3 Drive the machine until one plug is at the top and the other is at 90 degrees.



models with pipe plugs



models with o-ring plugs

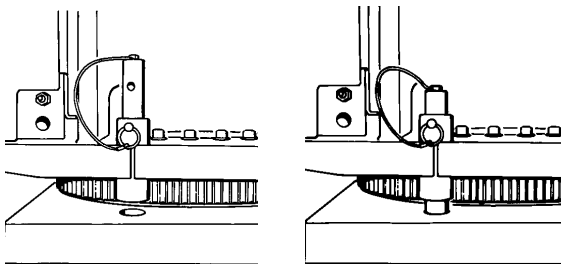
CHECKLIST A PROCEDURES

REV C

- 4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side hole. Apply pipe thread sealant to the plugs. Install the plugs.
- 5 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.
Models with O-ring plugs: Install the plugs into the drive hub.
- 6 Repeat steps 1 through 5 for the other drive hub.

Turntable Rotate Drive Hub:

- 1 Secure the turntable from rotating with the turntable rotation lock pin.

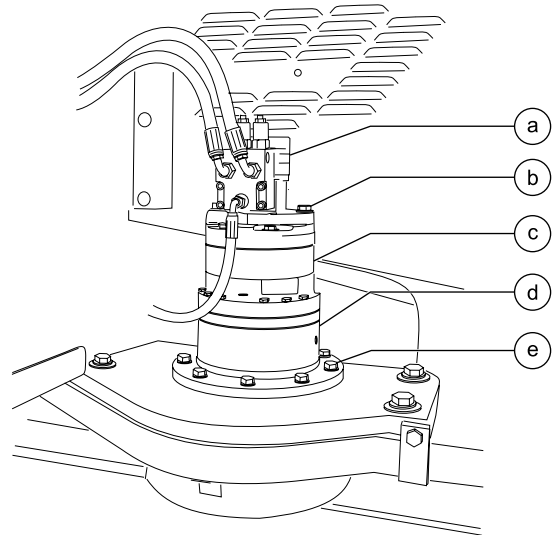


unlocked

locked

- 2 Remove the motor/brake mounting bolts, and then remove the motor and brake from the drive hub and set them to the side.

CAUTION Component damage hazard.
Hoses can be damaged if they are kinked or pinched.



- a motor
- b motor/brake mounting bolts
- c brake
- d drive hub
- e drive hub mounting bolts

- 3 Remove the drive hub mounting bolts, and use a lifting device to remove the drive hub from the machine.
- 4 Remove the plug from the side of the drive hub. Drain the oil from the hub into a container of adequate capacity. Refer to Section 2, *Specifications*.
- 5 Install the drive hub. Torque the drive hub mounting bolts to specification. Refer to Section 2, *Specifications*.
- 6 Install the brake and motor onto the drive hub. Torque the motor/brake mounting bolts to specification. Refer to Section 2, *Specifications*.
- 7 Fill the hub with oil from the side hole until the oil level is even with the bottom of the hole. Apply pipe thread sealant to the plug. Install the plug.
- 8 Adjust turntable rotation gear backlash. Refer to Repair Procedure 9-1, *How to Adjust the Turntable Rotation Gear Backlash*.

REV C

CHECKLIST A PROCEDURES

A-12**Perform Engine Maintenance -
Gasoline/LPG Models****NOTICE**

Engine specifications require that this procedure be performed every 200 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook

Genie part number

77738

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook

Genie part number

84792

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

Checklist B Procedures

REV C

B-1

Inspect the Batteries



Proper battery condition is essential to good engine performance and operational safety. Improper fluid levels or damaged cables and connections can result in engine component damage and hazardous conditions. There are 2 batteries on this machine. One is used in starting the engine and the other is used to power the control system and auxiliary power unit. Both batteries are charged by the alternator through a battery separator.

⚠ WARNING Electrocuting hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

⚠ WARNING Bodily injury hazard. Batteries contain acid. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

- 1 Put on protective clothing and eye wear.
- 2 Be sure that the battery cable connections are free of corrosion.

NOTICE Adding terminal protectors and a corrosion preventative sealant will help eliminate corrosion on the battery terminals and cables.

- 3 Be sure that the battery hold downs and cable connections are tight.

- 4 Be sure that the battery separator wire connections are tight.
- 5 Fully charge the batteries and allow them to rest at least 6 hours.
- 6 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.
- 7 Check the ambient air temperature and adjust the specific gravity reading for each cell as follows:
 - Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
 - Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.
- Ⓞ Result: All battery cells display an adjusted specific gravity of 1.277 or higher. The battery is fully charged. Proceed to step 11.
- ✗ Result: One or more battery cells display a specific gravity of 1.217 or below. Proceed to step 8.
- 8 Perform an equalizing charge, OR fully charge the batteries and allow them to rest at least 6 hours.
- 9 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.

REV C

CHECKLIST B PROCEDURES

10 Check the ambient air temperature and adjust the specific gravity reading for each cell as follows:

- Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
- Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.
- ⊙ Result: All battery cells display a specific gravity of 1.277 or greater. The battery is fully charged. Proceed to step 13.

✗ Result: The difference in specific gravity readings between cells is greater than 0.1 OR the specific gravity of one or more cells is less than 1.177. Replace the battery.

11 Check the battery acid level. If needed, replenish with distilled water to 1/8 inch / 3 mm below the bottom of the battery fill tube. Do not overfill.

12 Install the vent caps and neutralize any electrolyte that may have spilled.

B-2

Inspect the Electrical Wiring

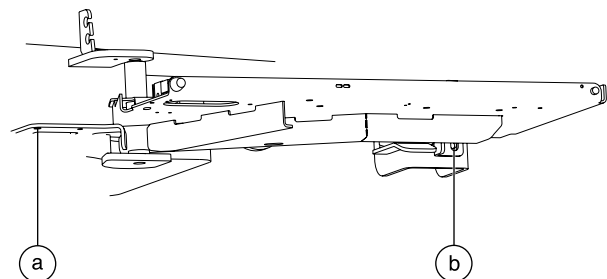


Maintaining electrical wiring in good condition is essential to safe operation and good machine performance. Failure to find and replace burnt, chafed, corroded or pinched wires could result in unsafe operating conditions and may cause component damage.

⚠ WARNING

Electrocution hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 1 Open the engine side turntable cover.
- 2 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



- a engine tray anchor hole
b engine tray retaining fastener

- 3 Locate the engine tray anchor hole at the pivot end of the engine tray.

CHECKLIST B PROCEDURES

REV C

- 4 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

- 5 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
- Engine wiring harness
 - Battery area wiring
- 6 Open the ground controls side turntable cover.
- 7 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
- Inside of the ground control box
 - Hydraulic manifold wiring
 - Hydraulic oil cooler wiring
- 8 Inspect for a liberal coating of dielectric grease at the following location:
- All wire harness connectors to the ground control box
 - Hydraulic manifold wiring
- 9 Start the engine from the ground controls and raise the secondary boom above the turntable covers.
- 10 Inspect the turntable area for burnt, chafed and pinched cables.
- 11 Lower the secondary boom to the stowed position and turn the engine off.
- 12 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
- Cable track on the boom
 - Cables on the boom and jib boom
 - Jib boom/platform rotate manifold
 - Inside of the platform control box
- 13 Remove the engine tray retaining fastener from the engine tray anchor hole at the pivot end of the engine tray.
- 14 Inspect for a liberal coating of dielectric grease at the following location:
- All wire harness connectors to the platform control box
 - Hydraulic manifold wiring
- 15 Swing the engine tray in towards the machine.
- 16 Install the bolt that was just removed into the original hole to secure the engine tray.

WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

REV C

CHECKLIST B PROCEDURES

B-3 Test the Key Switch

Proper key switch action and response is essential to safe machine operation. The machine can be operated from the ground or platform controls and the activation of one or the other is accomplished with the key switch. Failure of the key switch to activate the appropriate control panel could cause a hazardous operating situation.

- 1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 2 Turn the key switch to ground control, start the engine and then turn the key switch to **platform control**.
- 3 Check all machine function from the **ground controls**.
- ⊙ Result: All machine functions should **not** operate.
- 4 Turn the key switch to ground control.
- 5 Check all machine function from the **platform controls**.
- ⊙ Result: All machine functions should **not** operate.
- 6 Turn the key switch to the off position.
- ⊙ Result: The engine should stop and no functions should operate.

B-4 Check the Exhaust System



Maintaining the exhaust system is essential to good engine performance and service life. Operating the engine with a damaged or leaking exhaust system can cause component damage and unsafe operating conditions.

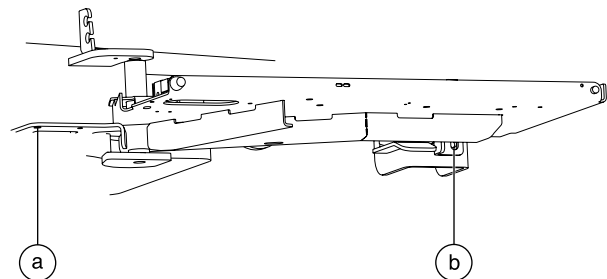
⚠ WARNING

Bodily injury hazard. Do not inspect while the engine is running. Remove the key to secure from operation.

⚠ CAUTION

Bodily injury hazard. Beware of hot engine components. Contact with hot engine components may cause severe burns.

- 1 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



- a engine tray anchor hole
b engine tray retaining fastener

CHECKLIST B PROCEDURES

REV C

- 2 Locate the engine tray anchor hole at the pivot end of the engine tray.
- 3 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠ WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

- 4 Be sure that all nuts and bolts are tight.
- 5 Inspect all welds for cracks.
- 6 Inspect for exhaust leaks (i.e., carbon buildup) around seams and joints.
- 7 Remove the engine tray retaining fastener from the engine tray anchor hole at the pivot end of the engine tray.
- 8 Swing the engine tray in towards the machine.
- 9 Install the bolt that was just removed into the original hole to secure the engine tray.

⚠ DANGER Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

B-5 Inspect the Engine Air Filter

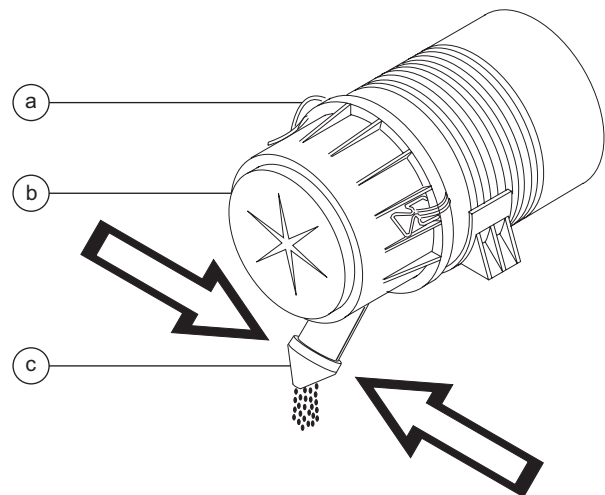


NOTICE Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first. Perform this procedure more often if dusty conditions exist.

Maintaining the engine air filter in good condition is essential to good engine performance and service life. Failure to perform this procedure can lead to poor engine performance and component damage.

NOTICE Perform this procedure with the engine off.

- 1 Open the engine side cover. Empty the dust discharge valve by pressing together the sides of the discharge slot. Clean the discharge slot as needed.



- a retaining clamp
- b canister end cap
- c dust discharge valve

REV C

CHECKLIST B PROCEDURES

- 2 Disconnect the retaining clamp from the air cleaner canister.
- 3 Remove the filter element.
- 4 Clean the inside of the canister and the gasket with a damp cloth.
- 5 Inspect the air filter element. If needed, blow from the inside out using low pressure dry compressed air, or carefully tap out dust.
- 6 Install the filter element.
- 7 Install the air filter canister end cap and connect the end cap retaining clamp.

B-6**Perform Engine Maintenance -
Deutz Models****NOTICE**

Engine specifications require that this procedure be performed every 250 hours.

Deutz Models

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341)

Deutz 913 Operation Manual

Genie part number

62446

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠ WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST B PROCEDURES

REV C

B-7

Check the Tires, Wheels and Lug Nut Torque



Maintaining the tires and wheels in good condition, including proper wheel fastener torque, is essential to safe operation and good performance. Tire and/or wheel failure could result in a machine tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

NOTICE The tires on this machine are foam filled and do not need air added to them.

- 1 Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.
- 2 Check each wheel for damage, bends and cracked welds.
- 3 Check each lug nut for proper torque. Refer to Section 2, *Specifications*.

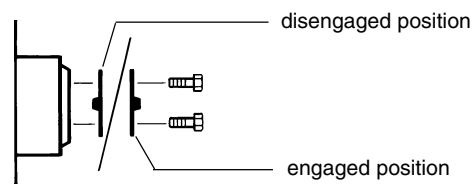
B-8

Confirm the Proper Brake Configuration



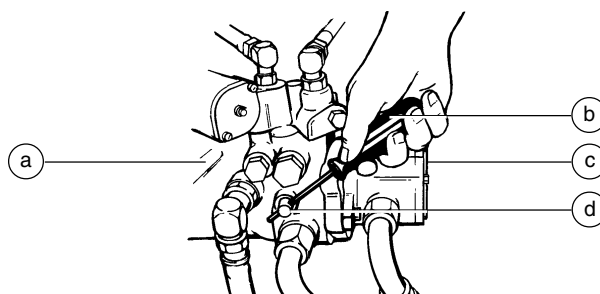
Proper brake configuration is essential to safe operation and good machine performance. Hydrostatic brakes and hydraulically-released, spring-applied individual wheel brakes can appear to operate normally when they are actually not fully operational.

- 1 Check each drive hub disconnect cap to be sure it is in the engaged position.



- 2 Be sure the free-wheel valve on the drive pump is closed (clockwise).

NOTICE The free-wheel valve is located on the drive pump.



- a drive pump
- b screwdriver
- c lift pump
- d free-wheel valve

NOTICE The free-wheel valve should always remain closed.

REV C

CHECKLIST B PROCEDURES

B-9

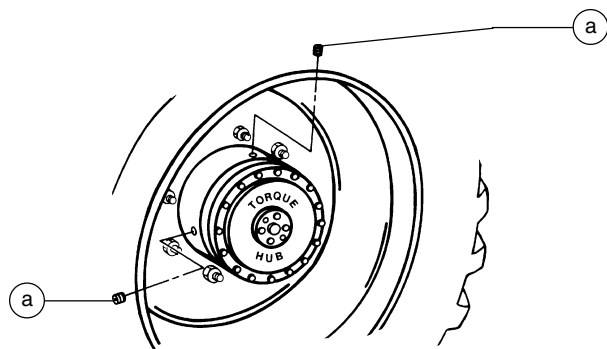
Check the Drive Hub Oil Level and Fastener Torque



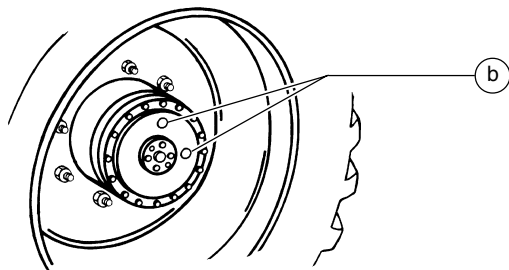
Failure to maintain proper drive hub oil levels may cause the machine to perform poorly and continued use may cause component damage.

Drive hubs

- 1 Drive the machine to rotate the hub until one of the plugs is located on top and the other one is at 90 degrees.



a. models with pipe plugs



b. models with o-ring plugs

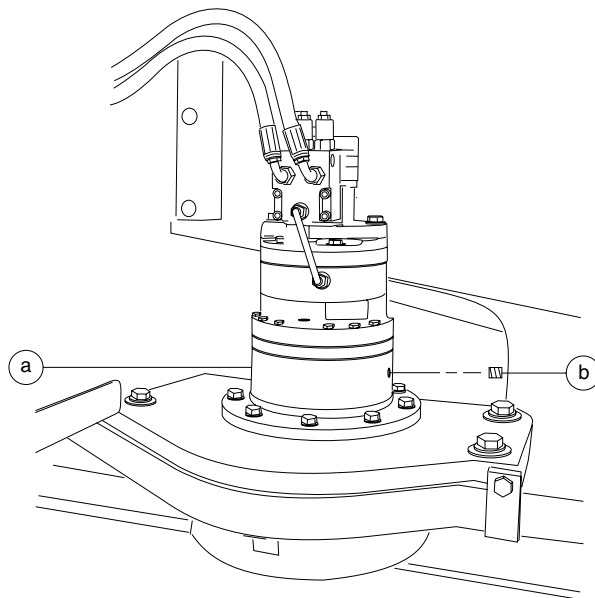
- 2 Remove the plug located at 90 degrees and check the oil level.
- ① Result: The oil level should be even with the bottom of the side plug hole.
- 3 If necessary, remove the top plug and add oil until the oil level is even with the bottom of the side plug hole.
- 4 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.
- Models with O-ring plugs:** Install the plugs into the drive hub. Torque to Specification. Refer to Section 2, *Specifications*.
- 5 Repeat steps 1 through 4 for the other drive hub.
- 6 Check the torque of the drive hub mounting fasteners. Refer to Section 2, *Specifications*.

CHECKLIST B PROCEDURES

REV C

Turntable rotate drive hub

- 1 Remove the plug located on the side of the hub and check the oil level.
- ⊙ Result: The oil level should be even with the bottom of the plug hole opening.



- 2 If necessary, add oil until the oil level is even with the bottom of the plug hole opening.
- 3 Apply pipe thread sealant to the plug, and install the plug in the drive hub.

B-10**Test the Ground Control Override**

A properly functioning ground control override is essential to safe machine operation. The ground control override function is intended to allow ground personnel to operate the machine from the ground controls whether or not the Emergency Stop button on the platform controls is in the ON or OFF position. This function is particularly useful if the operator at the platform controls cannot return the boom to the stowed position.

- 1 Push in the platform red Emergency Stop button to the off position.
- 2 Start the engine from the ground controls.
- 3 At the ground controls, operate each boom function through a partial cycle.
- ⊙ Result: All boom functions should operate.

REV C

CHECKLIST B PROCEDURES

B-11

Test the Platform Self-leveling



Automatic platform self-leveling throughout the full cycle of primary boom raising and lowering is essential for safe machine operation. The platform is maintained level by the communication between the platform level sensor and the turntable level sensor. If the platform becomes out of level, the computer at the ground controls will open the appropriate solenoid valve(s) at the platform manifold to maintain a level platform. A platform self-leveling failure creates an unsafe working condition for platform and ground personnel.

- 1 Start the engine from the ground controls.
- 2 Press and hold a function enable/speed select button and fully retract the primary boom.
- 3 Push one of the LCD screen buttons shown until platform angle is displayed.
- 4 Press and hold a function enable/speed select button and adjust the platform to zero degrees using the platform level up/down buttons.



- 5 Push and hold a function enable/speed select button and fully raise the primary boom while observing the platform angle shown on the LCD display.
- ⦿ Result: The platform should remain level at all times to within ± 2 degrees.

NOTICE

If the platform becomes out of level, the tilt alarm will sound and the Platform Not Level Indicator will flash at the ground controls. The platform level up/down buttons will only work in the direction that will level the platform. Level the platform until the indicator light turns off.

- 6 Push and hold a function enable/speed select button and fully lower the primary boom.
- ⦿ Result: The platform should remain level at all times to within ± 2 degrees.

NOTICE

If the platform becomes out of level, the tilt alarm will sound and the Platform Not Level Indicator will flash at the ground controls. The platform level up/down buttons will only work in the direction that will level the platform. Level the platform until the indicator light turns off.

CHECKLIST B PROCEDURES

REV C

B-12**Test the Engine Idle Select Operation**

A properly operating engine idle select function is essential to good engine performance and safe machine operation. There are three settings.

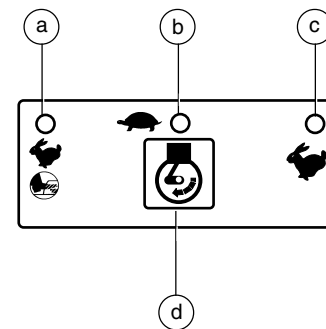
Low idle (turtle symbol) allows the operator to control multiple boom and/or drive functions simultaneously, though at reduced speed. This setting maintains a consistent low idle.

High idle (rabbit symbol) allows the operator to control multiple boom and/or drive functions simultaneously. This setting maintains a consistent high idle.

Foot switch activated high idle (rabbit and foot switch symbols) should be used for normal machine operation. This selection activates high idle only when the foot switch is pressed down.

- 1 Turn the key switch to ground controls.
- 2 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 3 Start the engine from the ground controls.
- 4 Push and release the rpm select button until high rpm is selected (rabbit symbol).
- ⊙ Result: The engine should change to high idle.
- 5 Push and release the rpm select button until low rpm is selected (turtle symbol).
- ⊙ Result: The engine should return to low idle.

- 6 Turn the key switch to platform controls.
- 7 At the platform controls, press the engine idle select button until high idle (rabbit symbol) is selected.
- ⊙ Result: The engine should change to high idle.



- a foot switch activated high idle indicator light
- b low idle indicator light
- c high idle indicator light
- d engine rpm select button

- 8 Press the engine idle select button until low idle (turtle symbol) is selected.
- ⊙ Result: The engine should change to low idle.
- 9 Press the engine idle select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected.
- ⊙ Result: The engine should **not** change to high idle.
- 10 Press down the foot switch.
- ⊙ Result: The engine should change to high idle.

REV C

CHECKLIST B PROCEDURES

B-13**Test the Fuel Select Operation - Gasoline/LPG Models**

The ability to select and switch between gasoline and LPG fuels as needed is essential to safe machine operation. A fuel selection can be made whether the engine is running or not. Switching malfunctions and/or the failure of the engine to start and run properly in both fuel modes and through all idle speeds can indicate fuel system problems that could develop into a hazardous situation.

NOTICE

Perform this test after checking the gasoline and LPG fuel levels, and warming the engine to normal operating temperature.

- 1 Turn the key switch to platform controls and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.
- 2 Press the fuel select button to gasoline mode.
- 3 Start the engine from the platform controls and allow the engine to run at low idle.
- 4 At the platform controls, press the engine idle select button until foot switch activated high idle (rabbit and foot switch symbol) is selected.

- 5 Press down the foot switch to allow the engine to run at high idle.
- ⦿ Result: The engine should start promptly and operate smoothly in low and high idle.
- 6 Release the foot switch and shut the engine off by pushing the red Emergency Stop button in to the off position.
- 7 Pull the red Emergency Stop button out to the on position at the platform controls.
- 8 Press the fuel select button to LPG mode.
- 9 Start the engine and allow it to run at low idle.
- 10 Press down the foot switch to allow the engine to run at high idle.
- ⦿ Result: The engine should start promptly and operate smoothly in low and high idle.

NOTICE

The engine may hesitate momentarily and then continue to run on the selected fuel if the fuel source is switched while the engine is running.

CHECKLIST B PROCEDURES

REV C

B-14**Test the Drive Brakes**

Proper brake action is essential to safe machine operation. The drive brake function should operate smoothly, free of hesitation, jerking and unusual noise. Hydraulically-released individual wheel brakes can appear to operate normally when they are actually not fully operational.

⚠ WARNING Collision hazard. Be sure that the machine is not in free-wheel or partial free-wheel configuration. See B-8, *Confirm the Proper Brake Configuration*.

NOTICE Select a test area that is firm, level and free of obstructions.

- 1 Mark a test line on the ground for reference.
- 2 Start the engine from the platform controls.
- 3 Press the engine rpm select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected, then lower the boom into the stowed position.
- 4 Choose a point on the machine (i.e., contact patch of a tire) as a visual reference for use when crossing the test line.
- 5 Bring the machine to top drive speed before reaching the test line. Release the drive controller when your reference point on the machine crosses the test line.
- 6 Measure the distance between the test line and your machine reference point. Refer to Section 2, *Specifications*.

NOTICE The brakes must be able to hold the machine on any slope it is able to climb.

B-15**Test the Drive Speed - Stowed Position**

Proper drive function movement is essential to safe machine operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also be free of hesitation, jerking and unusual noise over the entire proportionally controlled speed range.

NOTICE Select a test area that is firm, level and free of obstructions.

NOTICE Perform this procedure with the boom in the stowed position.

- 1 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.
- 2 Start the engine from the platform controls.
- 3 Press the engine rpm select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected.
- 4 Choose a point on the machine; i.e., contact patch of a tire as a visual reference for use when crossing the start and finish lines.
- 5 Bring the machine to top drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.
- 6 Continue at full speed and note the time when the machine reference point crosses the finish line. Refer to Section 2, *Specifications*.

REV C

CHECKLIST B PROCEDURES

B-16

Test the Drive Speed - Raised or Extended Position



Proper drive function movement is essential to safe machine operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also be free of hesitation, jerking and unusual noise over the entire proportionally controlled speed range.

NOTICE Select a test area that is firm, level and free of obstructions.

- 1 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.
- 2 Start the engine from the platform controls.
- 3 Press the engine rpm select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected.
- 4 Press down the foot switch and raise the boom until the engine switches to low idle.
- 5 Choose a point on the machine; i.e., contact patch of a tire as a visual reference for use when crossing the start and finish lines.
- 6 Bring the machine to top drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.
- 7 Continue at full speed and note the time when the machine reference point crosses the finish line. Refer to Section 2, *Specifications*.
- 8 Lower the boom to the stowed position.
- 9 Extend the boom 4 feet / 1.2 m.
- 10 Choose a point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the start and finish lines.
- 11 Bring the machine to top drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.
- 12 Continue at top speed and note the time when the machine reference point crosses the finish line. Refer to Section 2, *Specifications*.

CHECKLIST B PROCEDURES

REV C

B-17**Test the Alarm and Optional Flashing Beacon**

An alarm and optional flashing beacon are installed to alert operators and ground personnel of machine proximity and motion. There are four alarm option modes that can be activated based on user preference or requirement. Refer to *Display Module* in the Repair Section for information.

- 1 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- ⊙ Result: The alarm should sound twice. The flashing beacon (if equipped) should be on and flashing.

B-18**Perform Hydraulic Oil Analysis**

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and a clogged suction strainer may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often.

NOTICE

Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.** See E-1, *Test or Replace the Hydraulic Oil*.

REV C

CHECKLIST B PROCEDURES

B-19

Check and Adjust the Engine RPM



Maintaining the engine rpm at the proper setting for both low and high idle is essential to good engine performance and service life. The machine will not operate properly if the rpm is incorrect and continued use may cause component damage.

GM models:

NOTICE

The engine rpm is controlled by the ECM and can only be adjusted by re-programming the ECM. If rpm adjustment or service is required, please contact the Genie Industries Service Department or your local GM dealer.

Ford models:

NOTICE

The engine rpm is controlled by the ECM and can only be adjusted by re-programming the ECM. If rpm adjustment or service is required, please contact Genie Industries Service Department or your local Ford dealer.

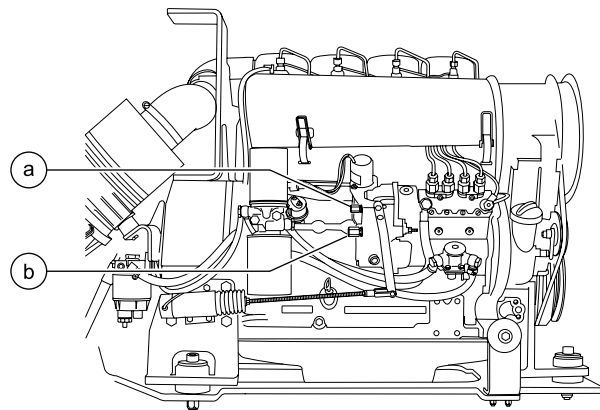
Deutz 913 models:

- 1 Start the engine from the ground controls.
- 2 Push one of the LCD screen buttons shown until engine rpm is displayed. Refer to Section 2, *Specifications*.



Skip to step 11 if the low idle rpm is correct.

- 3 Remove the secondary idle adjustment screw cap from the secondary idle adjustment screw on the injection pump. Loosen the locknut.



a primary idle adjustment screw
b secondary idle adjustment screw

- 4 Turn the secondary adjustment screw counterclockwise until the adjustment screw is loose. Tighten the locknut.

NOTICE

Be sure the adjustment screw is loosened until there is no spring tension felt.

- 5 Remove the primary idle adjustment screw cap from the primary idle adjustment screw on the injection pump. Loosen the locknut.
- 6 Adjust the primary idle adjustment screw until low idle meets specification. Tighten the locknut.
- 7 Install the primary idle adjustment screw cap and tighten. Do not over tighten.
- 8 Loosen the secondary idle adjustment screw locknut.

CHECKLIST B PROCEDURES

REV C

- 9 Adjust the secondary adjustment screw until the low idle meets specification. Tighten the locknut.

- 10 Install the secondary idle adjustment screw cap and tighten. Do not over tighten.

- 11 Push and hold the function enable/high speed button. Note the engine rpm on the display. Refer to Section 2, *Specifications*.

If the high idle is correct, disregard adjustment step 12.

- 12 Loosen the yoke lock nut. Turn the high idle adjustment nut and solenoid boot counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the yoke lock nut and recheck the rpm.

NOTICE

Be sure the solenoid fully retracts when activating high idle.

Deutz BF4L2011 models:

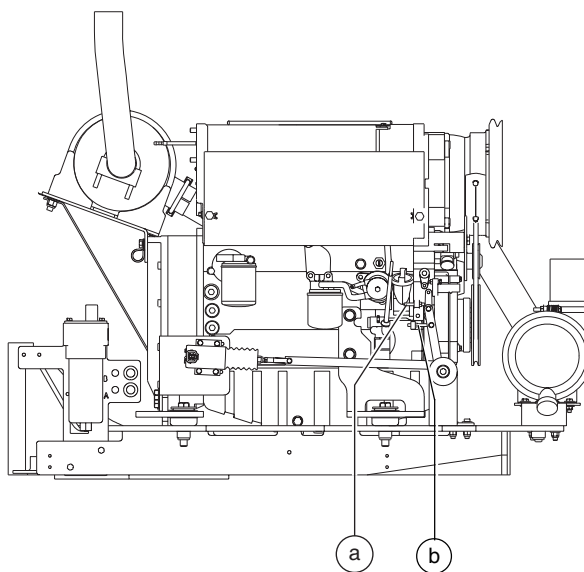
- 1 Start the engine from the ground controls.

- 2 Push one of the LCD screen buttons shown until engine rpm is displayed. Refer to Section 2, *Specifications*.



Skip to step 5 if the low idle rpm is correct.

- 3 Loosen the locknut on the low idle adjustment screw.



a low idle adjustment screw
b high idle adjustment screw

- 4 Adjust the low idle adjustment screw until low idle meets specification. Tighten the locknut.
- 5 Push and hold the function enable/high speed button. Note the engine rpm on the display. Refer to Section 2, *Specifications*.

If the high idle is correct, disregard adjustment step 6.

- 6 Loosen the yoke lock nut. Turn the high idle adjustment nut and solenoid boot counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the yoke lock nut and recheck the rpm.

NOTICE

Be sure the solenoid fully retracts when activating high idle.

REV C

CHECKLIST B PROCEDURES

Perkins models:

1 Start the engine from the ground controls.

2 Push one of the LCD screen buttons shown until engine rpm is displayed. Refer to Section 2, *Specifications*.

**Skip to step 4 if the low idle rpm is correct.**

3 Loosen the low idle lock nut and turn the low idle adjustment screw clockwise to increase the rpm, or counterclockwise to decrease the rpm. Tighten the low idle lock nut and confirm the rpm.

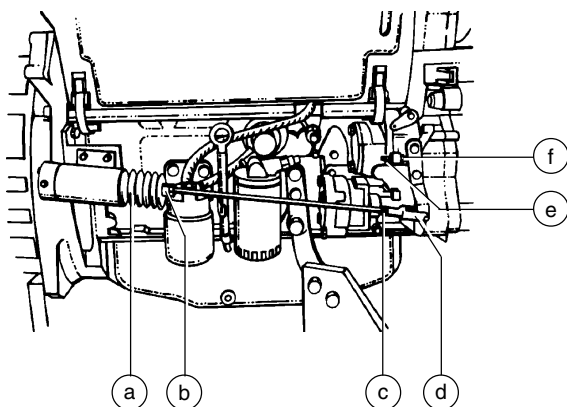
4 Push and hold the function enable/high speed button. Note the engine rpm on the display. Refer to Section 2, *Specifications*.

If high idle rpm is correct, disregard adjustment step 5.

5 Loosen the yoke lock nut, then turn the high idle adjustment nut counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the yoke lock nut and confirm the rpm.

NOTICE

Be sure the solenoid fully retracts when activating high idle.



- a solenoid boot
- b high idle adjustment nut
- c yoke lock nut
- d yoke
- e low idle adjustment screw
- f low idle lock nut

CHECKLIST B PROCEDURES

REV C

B-20**Test the Safety Envelope and Circuits**

Testing the machine safety envelope is critical to safe machine operation. If the boom is allowed to operate when a safety switch is not functioning correctly, the machine stability is compromised and may tip over. Refer to Section 6 for limit switch and angle sensor information.

Secondary Boom #1 Angle Safety Limit Switch, LSS2AS

- 1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.
- 2 Start the engine from the ground controls.
- 3 Simultaneously push the LCD screen buttons shown to activate status mode.



- 4 Push one of the LCD screen buttons shown until secondary boom status is displayed.



- 5 Fully raise the secondary boom and extend the secondary boom approximately 2 feet / 61 cm.
- 6 Remove the fasteners from the turntable riser cover at the pivot end of the secondary boom. Remove the cover.

- 7 Locate secondary boom #1 retract operational limit switch (LSS1RO) at the end of the secondary boom.
- 8 Carefully disconnect the wire harness from LSS1RO and install a wire jumper between pin 1 and pin 2 of the deutsch connector on the wire harness.
- 9 Install a second wire jumper between pin 3 and pin 4 of the deutsch connector on the wire harness.

⊙ Result: The display should show = 0FT.

- 10 Press and hold the low speed function enable button and lower the secondary boom.

⊙ Result: The secondary boom should lower to 60° and the engine should stop.

✖ Result: If the engine does not stop at 60° and the secondary boom continues to lower, the secondary boom #2 angle safety limit switch (LSS2AS) is out of adjustment or the wiring circuit is faulty and will need to be replaced or repaired.

⚠ WARNING

Bodily injury hazard. If the secondary boom lowers to less than 60° without stopping the engine, stop immediately and raise the secondary boom above 60°. Failure to raise the secondary boom could result in death or serious injury.

- 11 Remove the wire jumpers installed in steps 8 and 9 and connect the wire harness to LSS1RO.

REV C

CHECKLIST B PROCEDURES

Secondary Boom #1 Retracted Safety Limit Switch, LSS1RS

- 12 Simultaneously push the LCD screen buttons shown to activate status mode.



- 13 Push one of the LCD screen buttons shown until secondary boom status is displayed.



- 14 Raise the secondary boom until the display shows >35 DEGREES.
- 15 Locate the secondary boom #2 angle operational limit switch (LSS2AO) on the inside of the turntable riser.
- 16 Carefully disconnect the wire harness from LSS2AO and install a wire jumper between pins 1 and 2 of the deutsch connector on the wire harness. Install a second wire jumper between pins 3 and 4 of the deutsch connector.

- ☉ Result: The display should show AT 65 DEGREES.

- 17 Press and hold the low speed function enable button and extend the secondary boom.

- ☉ Result: The secondary boom should extend 12 inches / 30.5 cm and stop. The engine should stop and the display will show P9B SAFETY FAULT and P11 SAFETY FAULT.

- ✗ Result: If the engine does not stop and the secondary boom continues to extend, the secondary boom #1 retracted safety limit switch (LSS1RS) is out of adjustment or the wiring circuit is faulty and will need to be replaced or repaired.

WARNING

Bodily injury hazard. If the secondary boom continues to extend without stopping the engine, stop immediately and retract the secondary boom. Failure to retract the secondary boom could result in death or serious injury.

- 18 Remove the wire jumpers installed in step 16 and connect the wire harness to LSS2AO.

CHECKLIST B PROCEDURES

REV C

B-21**Test the Primary Boom Self-leveling****NOTICE**

The primary boom self-leveling function is adjustable on machines with software revision 1.03 and lower. This function is not adjustable on machines with a software revision higher than 1.03. Refer to Repair Procedure 6-1, *How to Determine the Revision Level*.

Automatic primary boom self-leveling throughout the full cycle of secondary boom raising and lowering is essential for safe machine operation. The primary boom is maintained level by the communication between the platform level sensor and the turntable level sensor. If the platform becomes out of level, the computer at the ground controls will open the appropriate solenoid valve(s) at the function manifold to maintain a level primary boom.

- 1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.
- 2 Push one of the LCD screen buttons shown until primary boom angle is displayed.
- 3 Start the engine and level the platform until the displays shows 0 DEGREES.



- 4 Fully raise the secondary boom while watching the display at the ground controls. Stop when the secondary boom just begins to extend.
- Result: The primary boom should remain level at all times to within ± 2 degrees.

NOTICE

If the platform becomes out of level, the tilt alarm will sound and the platform not level indicator will turn on. Level the platform until the indicator light turns off.

REV C

CHECKLIST B PROCEDURES

B-22**Test the Primary Boom Angle Sensor**

A properly functioning primary boom angle sensor (PBAS) is essential to safe machine operation. The primary boom angle sensor is used to limit the angle of the primary boom relative to the angle of the secondary boom and gravity. The ECM at the ground controls (TCON) monitors the position and angle of the primary boom using the signal from PBAS. The PBAS signal is used to control the ramping of the primary boom as well as velocity control, limiting the speed of the primary boom to 1.3 feet / 0.4 meters per second.

NOTICE Perform this procedure on a firm, level surface.

- 1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.
- 2 Push one of the LCD screen buttons shown until primary boom angle is displayed.



- 3 Start the engine from the ground controls.
 - 4 Raise the primary boom. The display will begin showing a boom angle of 40°.
 - 5 Continue raising the primary boom until the display shows 65°.
- ⦿ Result: The primary boom should stop.
- ✗ Result: The primary boom does not stop. Immediately release the function enable button and lower the boom. Calibrate the limit switch. Refer to Repair Procedure 4-7 *How to Calibrate the Primary Boom Limit Switch*.

⚠ DANGER Crushing hazard. If the boom does not stop at 65°, immediately release the function enable button and lower the primary boom. Failure to lower the boom could cause the machine to tip over resulting in death or serious injury.

CHECKLIST B PROCEDURES

REV C

B-23**Inspect the Fuel and Hydraulic Tank Cap Venting Systems****NOTICE**

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first. Perform this procedure more often if dusty conditions exist.

Free-breathing fuel and hydraulic tank caps are essential for good machine performance and service life. A dirty or clogged tank cap may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the caps be inspected more often.

⚠ DANGER

Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

NOTICE

Perform this procedure with the engine off.

- 1 Remove the cap from the fuel tank.

- 2 Check for proper venting.

○ Result: Air passes through the fuel tank cap. Proceed to step 4.

✗ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 3.

NOTICE

When checking for positive tank cap venting, air should pass freely through the cap.

- 3 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 2.

- 4 Install the fuel tank cap onto the fuel tank.

- 5 Remove the breather cap from the hydraulic tank.

- 6 Check for proper venting.

○ Result: Air passes through the hydraulic tank cap. Proceed to step 8.

✗ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 7.

NOTICE

When checking for positive tank cap venting, air should pass freely through the cap.

- 7 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 6.

- 8 Install the breather cap onto the hydraulic tank.

REV C

CHECKLIST B PROCEDURES

B-24**Perform Engine Maintenance****NOTICE**

Engine specifications require that this procedure be performed quarterly or every 250 hours, whichever comes first.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341).

Deutz 913 Operation Manual

Genie part number 62446

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook

Genie part number 101840

Perkins 804C-33 Operation and Maintenance Manual

Genie part number 111332

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST B PROCEDURES

REV C

B-25**Perform Engine Maintenance -
Gasoline/LPG Models****NOTICE**

Engine specifications require that this procedure be performed every 400 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook

Genie part number

77738

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook

Genie part number

84792

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

REV C

Checklist C Procedures

C-1

Perform Engine Maintenance - Diesel Models



NOTICE

Engine specifications require that this procedure be performed every 500 hours.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz 913 Operation Manual

Genie part number 62446

Deutz BF4L2011 Operation Manual

Genie part number 84794

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook

Genie part number 101840

Perkins 804C-33 Operation and Maintenance Manual

Genie part number 111332

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠ WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

C-2

CHECKLIST C PROCEDURES

REV C

Grease the Platform Overload Mechanism (if equipped)



NOTICE

Genie specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first. Perform this procedure more often if dusty conditions exist.

Application of lubrication to the platform overload mechanism is essential to safe machine operation. Continued use of an improperly greased platform overload mechanism could result in the system not sensing an overloaded platform condition and will result in component damage.

- 1 Locate the grease fittings on each pivot pin of the platform overload assembly.
- 2 Thoroughly pump grease into each grease fitting using a multi-purpose grease.

Grease Specification

Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

- 4 Using a suitable lifting device, place an appropriate test weight equal to that of the maximum platform capacity in one of the locations shown.

C-3 Test the Platform Overload System (if equipped)



NOTICE

Genie specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first.

Testing the platform overload system regularly is essential to safe machine operation. Continued use of an improperly operating platform overload system could result in the system not sensing an overloaded platform condition. Machine stability could be compromised resulting in the machine tipping over.

NOTICE

Perform this procedure with the machine on a firm, level surface.

- 1 Turn the key switch to platform control. Start the engine and level the platform.
- 2 Determine the maximum platform capacity. Refer to the machine serial plate.
- 3 Remove all weight, tools and accessories from the platform.

NOTICE

Failure to remove all weight, tools and accessories from the platform will result in an inaccurate test.

REV C

CHECKLIST C PROCEDURES

- 4 Using a suitable lifting device, place a test weight equal to that of the available capacity one of the locations shown. Refer to Illustration 1.

⊙ Result: The platform overload indicator lights should be off at both the ground and platform controls and the alarm should not sound.

✗ Result: The platform overload indicator lights are on and the alarm is sounding. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped)*.

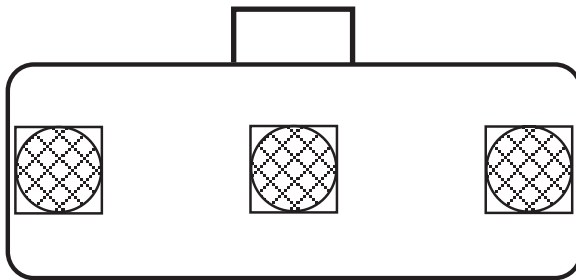


Illustration 1

- 5 Carefully move the test weight to each remaining location. Refer to Illustration 1.

⊙ Result: The platform overload indicator lights should be off at both the ground and platform controls and the alarm should not sound.

✗ Result: The platform overload indicator lights are on and the alarm is sounding. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped)*.

- 6 Using a suitable lifting device, place an additional 50 lbs / 23 kg of weight onto the platform.

⊙ Result: The alarm should sound. The platform overload indicator light should be flashing at the platform controls and "PLATFORM OVERLOAD" should be displayed on the LCD screen at the ground controls.

✗ Result: The alarm is not sounding OR the platform overload indicator light is not flashing OR "PLATFORM OVERLOAD" is not displayed on the LCD screen at the ground controls. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped)*.

NOTICE

There may be a 2 second delay before the overload indicator lights flash and the alarm sounds.

- 7 Carefully move the test weights to each remaining location on the platform. Refer to Illustration 1.

⊙ Result: The alarm should sound. The platform overload indicator lights should be flashing at both the ground and platform controls.

✗ Result: The alarm does not sound and the platform overload indicator lights are not flashing. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped)*.

NOTICE

There may be a 2 second delay before the overload indicator lights flash and the alarm sounds.

- 8 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

CHECKLIST C PROCEDURES

REV C

- 9 Turn the key switch to ground control.
- 10 Test all machine functions from the ground controls.
 - ⊙ Result: All ground control functions should not operate.
- 11 Press and hold the auxiliary power button.

NOTICE The engine will turn off when the auxiliary power is activated.
- 12 Using auxiliary power, test all machine functions from the ground controls.
 - ⊙ Result: All ground control functions should operate.
- 13 Using a suitable lifting device, lift the additional test weight from the platform.
 - ⊙ Result: The platform overload indicator lights should turn off at both the ground and platform controls and the alarm should not sound.

NOTICE

There may be an 2 second delay before the overload indicator lights and alarm turn off.

- 14 Start the engine and test all machine functions from the ground controls.
 - ⊙ Result: All ground control functions should operate normally.
- 15 Turn the key switch to platform control.
- 16 Test all machine functions from the platform controls.
 - ⊙ Result: All platform control functions should operate.

NOTICE

If the platform overload system is not operating properly, Refer to 2-4, *How to Calibrate the Platform Overload System (if equipped)*.

- 17 Using a suitable lifting device, remove the remaining test weights from the platform.

C-4**Replace the Engine Air Filter****NOTICE**

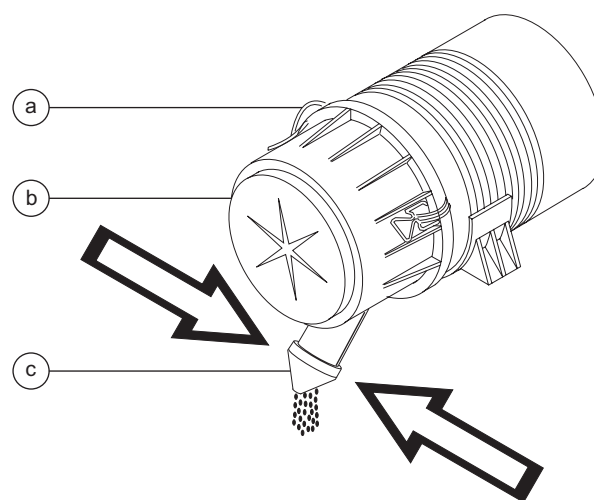
Engine specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first.

Maintaining the engine air filter in good condition is essential to good engine performance and service life. Failure to perform this procedure can lead to poor engine performance and component damage..

NOTICE

Perform this procedure with the engine off.

- 1 Open the engine side cover. Empty the dust discharge valve by pressing together the sides of the discharge slot. Clean the discharge slot as needed.



- a retaining clamp
- b canister end cap
- c dust discharge valve

REV C

CHECKLIST C PROCEDURES

Perkins 804C-33:

- 2 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 3 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠ WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

All Models:

- 4 Release the clamps from the end cap of the air filter canister. Remove the end cap.
- 5 Remove the filter element.
- 6 Clean the inside of the canister and the gasket with a damp cloth.
- 7 Install the new filter element.
- 8 Install the air filter canister end cap and connect the end cap retaining clamp.

C-5**Replace the Fuel/Water Separator - Diesel Models****NOTICE**

Genie specifications require that this procedure be performed every 500 hours or annually, whichever comes first.

Regular replacement of the fuel filter/water separator is essential for good engine performance. Failure to perform this procedure can lead to poor engine performance and/or hard starting, and continued use may result in component damage. Extremely dirty conditions may require this procedure be performed more often.

⚠ DANGER

Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

NOTICE

Perform this procedure with the engine off.

- 1 Open the engine side turntable cover and locate the fuel filter/water separator.

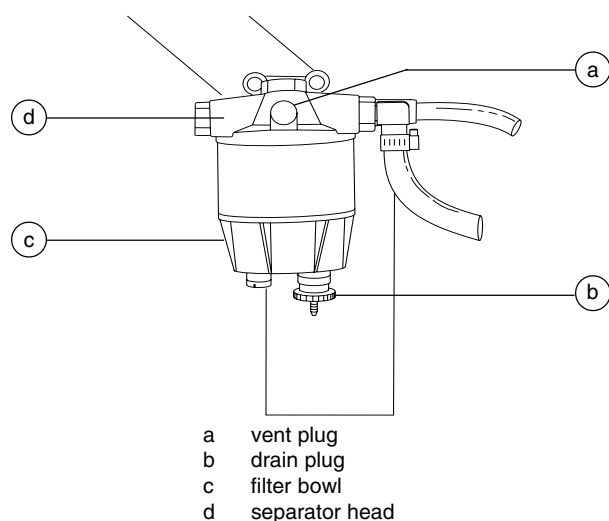
NOTICE

The fuel filter/water separator is located near the hydraulic pump.

CHECKLIST C PROCEDURES

REV C

- 2 Disconnect and plug the fuel supply hose from the fuel tank to the fuel filter/water separator head.
- 3 Loosen the vent plug located on the fuel filter/water separator head.



- 4 Place a suitable container under the filter bowl. Loosen the drain plug located at the bottom of the bowl. Completely drain the fuel.
- 5 Rotate the filter bowl counterclockwise and remove it from the element.
- 6 Rotate the filter element counterclockwise and remove it from the filter head.
- 7 Install the filter bowl onto the new filter element.

- 8 Apply a thin layer of oil onto the element gasket. Install the filter/bowl assembly onto the filter head. Tighten the drain plug and vent plug.

CAUTION Component damage hazard. The drain plug and vent plug can be damaged if they are overtightened.

- 9 Install the fuel supply hose from the fuel tank to the fuel filter/water separator. Tighten the clamp.
- 10 Clean up any diesel fuel that may have spilled during the installation procedure.
- 11 Use a permanent ink marker to write the date and number of hours from the hour meter on the filter element.

Bleed the fuel system:

NOTICE Before bleeding the system, fill the fuel tank.

- 12 Loosen the vent plug located on the fuel filter/water separator head.
- 13 Operate the priming lever of the fuel lift pump until fuel, free from air, comes from the vent plug. Tighten the vent plug.
- 14 Loosen the air vent screw, located on top of the fuel injection pump.
- 15 Tighten the air vent screw when air stops coming through the air vent.
- 16 Clean up any diesel fuel that may have spilled during the bleeding procedure and dispose of properly.
- 17 Start the engine from ground controls and check for leaks.

REV C

CHECKLIST C PROCEDURES

C-6**Perform Engine Maintenance -
Gasoline/LPG Models****NOTICE**

Engine specifications require that this procedure be performed every 800 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook

Genie part number 77738

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook

Genie part number 84792

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

Checklist D Procedures

REV C

D-1

Check the Boom Wear Pads



Maintaining the boom wear pads in good condition is essential to safe machine operation. Wear pads are placed on boom tube surfaces to provide a low friction, replaceable wear pad between moving parts. Improperly shimmed wear pads or continued use of extremely worn wear pads may result in component damage and unsafe operating conditions. Refer to Section 2, *Specifications*, for Boom Wear Pad Specifications.

- 1 Start the engine from the ground controls.
- 2 Raise the end of the boom to a comfortable working height (chest high), then extend the boom 1 foot / 30 cm.
- 3 Measure each wear pad.
- ⊙ Result: Replace the wear pad if it is less than specification. If the wear pad is still within specification, shim as necessary to obtain zero clearance and zero drag. Refer to Repair Procedure 4-2, *How to Shim the Boom*.
- 4 Extend and retract the boom through the entire range of motion to check for tight spots that may cause binding or scraping of the boom.

NOTICE Always maintain squareness between the outer and inner boom tubes.

D-2

Check the Free-wheel Configuration

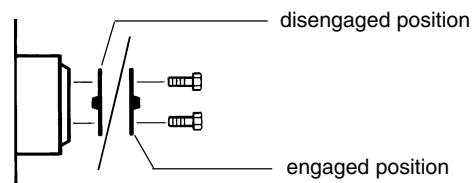


Proper use of the free-wheel configuration is essential to safe machine operation. The free-wheel configuration is used primarily for towing. A machine configured to free-wheel without operator knowledge may cause death or serious injury and property damage.

WARNING Collision hazard. Select a work site that is firm and level.

CAUTION Component damage hazard. If the machine must be towed, do not exceed 2 mph / 3.2 km/h.

- 1 Chock the steer wheels to prevent the machine from rolling.
- 2 Center a lifting jack of ample capacity (20,000 lbs / 10,000 kg) under the drive chassis between the wheels at the non-steer end of the machine.
- 3 Lift the wheels off the ground and place blocks under the drive chassis for support.
- 4 Disengage the drive hubs by turning over the drive hub disconnect caps on each non-steer wheel hub.



REV C

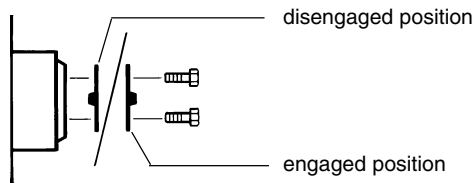
CHECKLIST D PROCEDURES

- 5 Manually rotate each non-steer wheel.
- ⊙ Result: Each non-steer wheel should rotate with minimum effort.
- 6 Re-engage the drive hubs by turning over the hub disconnect caps. Rotate each wheel to check for engagement. Lift the machine and remove the blocks.

⚠ WARNING Collision hazard. Failure to re-engage the drive hubs could result in death or serious injury and property damage.

4WD models:

- 7 Chock the non-steering wheels to prevent the machine from rolling.
- 8 Center a lifting jack with a minimum capacity of 25,000 lbs / 12000 kg under the drive chassis between the steer wheels.
- 9 Lift the wheels off the ground and then place blocks under the drive chassis for support.
- 10 Disengage the drive hubs by turning over the drive hub disconnect caps on each steer wheel hub.



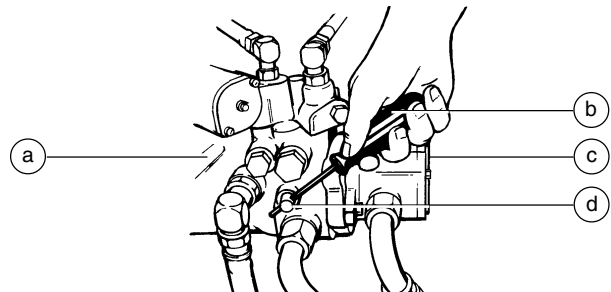
- 11 Manually rotate each steer wheel.
- ⊙ Result: Each steer wheel should rotate with minimum effort.
- 12 Re-engage the drive hubs by turning over the drive hub disconnect caps. Rotate each wheel to check for engagement. Lift the machine and remove the blocks.

⚠ WARNING Collision hazard. Failure to re-engage the drive hubs could result in death or serious injury and property damage.

All models:

- 13 Be sure the free-wheel valve on the drive pump is closed (clockwise).

NOTICE The free-wheel valve is located on the drive pump, and should always remain closed.



- a drive pump
b screwdriver
c lift pump
d free-wheel valve

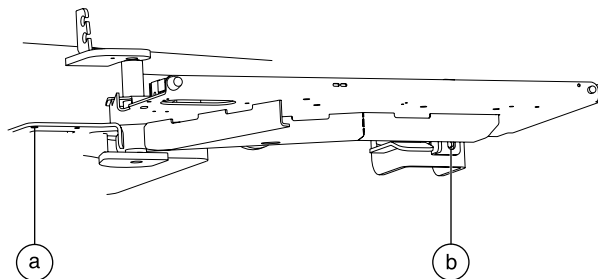
CHECKLIST D PROCEDURES

REV C

D-3**Check the Turntable Rotation Bearing Bolts**

Maintaining proper torque on the turntable bearing bolts is essential to safe machine operation. Improper bolt torque could result in an unsafe operating condition and component damage.

- 1 Raise the secondary boom approximately 8 feet / 2.4 m.
- 2 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



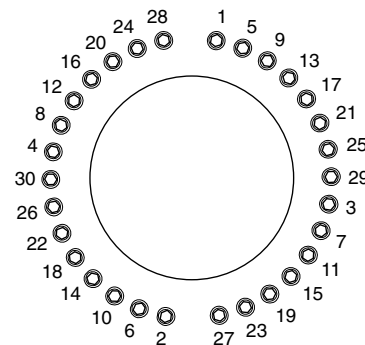
- a engine tray anchor hole
b engine tray retaining fastener

- 3 Locate the engine tray anchor hole at the pivot end of the engine tray.

- 4 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

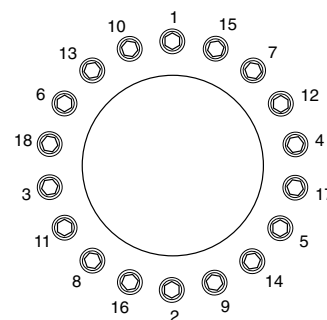
WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

- 5 Confirm that each turntable mounting bolt is torqued in sequence to specification. Refer to Section 2, *Specifications*.



Bolt torque sequence
(from above turntable)

- 6 Lower the boom to the stowed position.
- 7 Confirm that each bearing mounting bolt under the drive chassis is torqued in sequence to specification. Refer to Section 2, *Specifications*.



Bolt torque sequence
(from below chassis)

REV C

CHECKLIST D PROCEDURES

- 8 Lower the secondary boom to the stowed position.
- 9 Remove the engine tray retaining fastener from the engine tray anchor hole at the pivot end of the engine tray.
- 10 Swing the engine tray in towards the machine.
- 11 Install the bolt that was just removed into the original hole to secure the engine tray.

WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

D-4

Inspect for Turntable Bearing Wear



Periodic inspection of turntable bearing wear is essential to safe machine operation, good machine performance and service life. Continued use of a worn turntable bearing could create an unsafe operating condition, resulting in death or serious injury and component damage.

NOTICE

Perform this procedure with the machine on a firm, level surface and the boom in the stowed position.

- 1 Grease the turntable bearing. See A-7, *Grease the Turntable Bearing and Rotate Gear*.
- 2 Torque the turntable bearing bolts to specification. See D-3, *Check the Turntable Rotation Bearing Bolts*.
- 3 Start the machine from the ground controls and raise the boom to full height. Do not extend the boom.

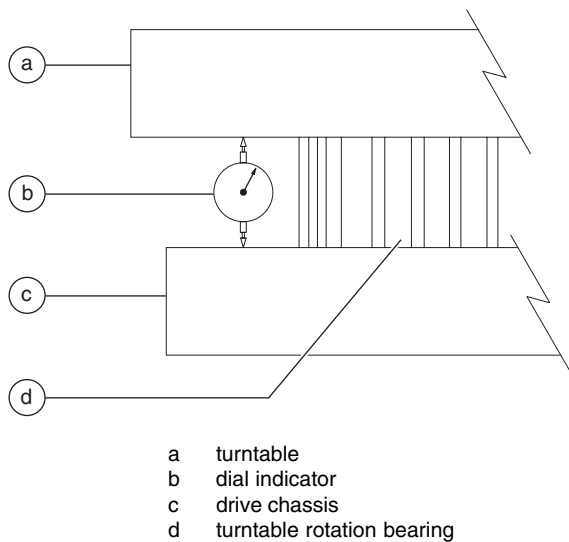
CHECKLIST D PROCEDURES

REV C

- 4 Place a dial indicator between the drive chassis and the turntable at a point that is directly under, or inline with, the boom and no more than 1 inch / 2.5 cm from the bearing.

NOTICE

To obtain an accurate measurement, place the dial indicator no more than 1 inch / 2.5 cm from the turntable rotation bearing.



- 5 At the dial indicator, adjust it to "zero" the indicator.
- 6 Fully extend the boom and lower to a horizontal position.

- 7 Note the reading on the dial indicator.

☉ Result: The measurement is less than 0.063 inch / 1.6 mm. The bearing is good.

☒ Result: The measurement is more than 0.063 inch / 1.6 mm. The bearing is worn and needs to be replaced.

- 8 Fully retract the boom and raise the boom to full height. Visually inspect the dial indicator to be sure the needle returns to the "zero" position.

- 9 Remove the dial indicator and rotate the turntable 90°.

- 10 Repeat steps 4 through 9 until the rotation bearing has been checked in at least four equally spaced areas 90° apart.

- 11 Lower the boom to the stowed position and turn the machine off.

- 12 Remove the dial indicator from the machine.

REV C

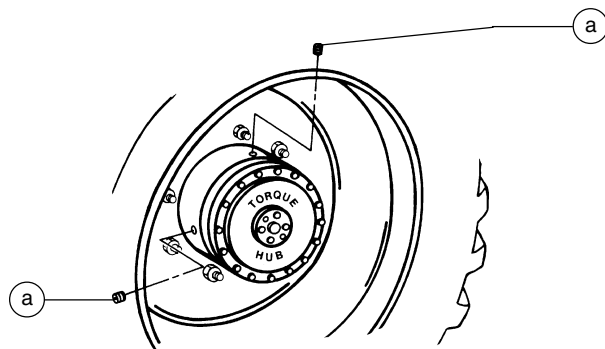
CHECKLIST D PROCEDURES

D-5**Replace the Drive Hub Oil**

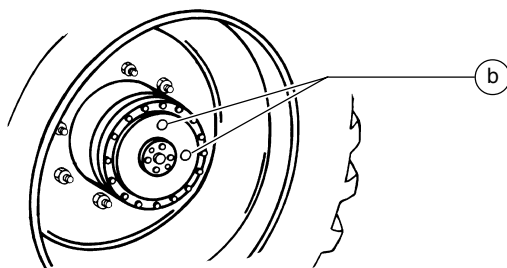
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil at yearly intervals may cause the machine to perform poorly and continued use may cause component damage.

Drive Hubs:

- 1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.
- 2 Remove both plugs and drain the oil into a suitable container.
- 3 Drive the machine until one plug is at the top and the other is at 90 degrees.



a models with pipe plugs

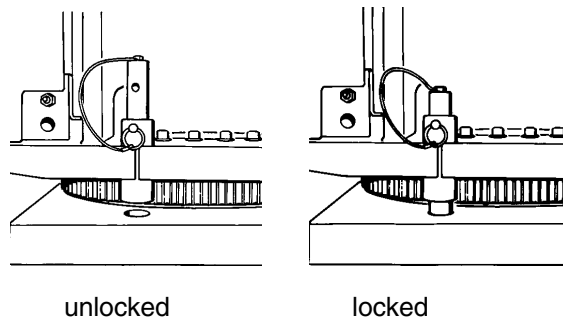


b models with o-ring plugs

- 4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side hole. Apply pipe thread sealant to the plugs. Install the plugs.
- 5 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.
Models with O-ring plugs: Install the plugs into the drive hub.
- 6 Repeat steps 1 through 5 for the other drive hub.

Turntable Rotate Drive Hub:

- 1 Secure the turntable from rotating with the turntable rotation lock pin.



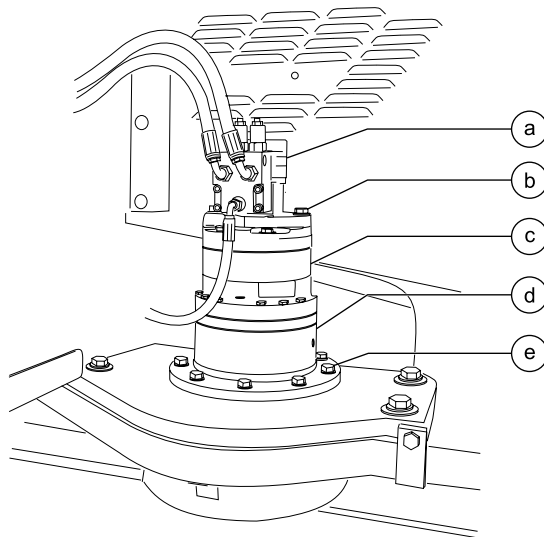
CHECKLIST D PROCEDURES

REV C

- 2 Remove the motor/brake mounting bolts, and then remove the motor and brake from the drive hub and set them to the side.

CAUTION

Component damage hazard.
Hoses can be damaged if they are kinked or pinched.



- a motor
- b motor/brake mounting bolts
- c brake
- d drive hub
- e drive hub mounting bolts

- 3 Remove the drive hub mounting bolts, and use a lifting device to remove the drive hub from the machine.
- 4 Remove the plug from the side of the drive hub. Drain the oil from the hub into a container of adequate capacity. Refer to Section 2, *Specifications*.
- 5 Install the drive hub. Torque the drive hub mounting bolts to specification. Refer to Section 2, *Specifications*.
- 6 Install the brake and motor onto the drive hub. Torque the motor/brake mounting bolts to specification. Refer to Section 2, *Specifications*.
- 7 Fill the hub with oil from the side hole until the oil level is even with the bottom of the hole. Apply pipe thread sealant to the plug. Install the plug.
- 8 Adjust turntable rotation gear backlash. Refer to Repair Procedure 9-1, *How to Adjust the Turntable Rotation Gear Backlash*.

REV C

CHECKLIST D PROCEDURES

D-6

Perform Engine Maintenance - Diesel Models



NOTICE

Engine specifications require that this procedure be performed every 1000 hours.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz 913 Operation Manual

Genie part number 62446

Deutz BF4L2011 Operation Manual

Genie part number 84794

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook

Genie part number 101840

Perkins 804C-33 Operation and Maintenance Manual

Genie part number 111332

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST D PROCEDURES

REV C

D-7**Replace the Hydraulic Filter Elements****NOTICE**

Genie requires that this procedure be performed annually or every 1000 hours, whichever comes first. Perform this procedure more often if dusty conditions exist.

Replacement of the hydraulic filters is essential for good machine performance and service life. A dirty or clogged filter may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

CAUTION

Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

NOTICE

Perform this procedure with the engine off.

Hydraulic return filter

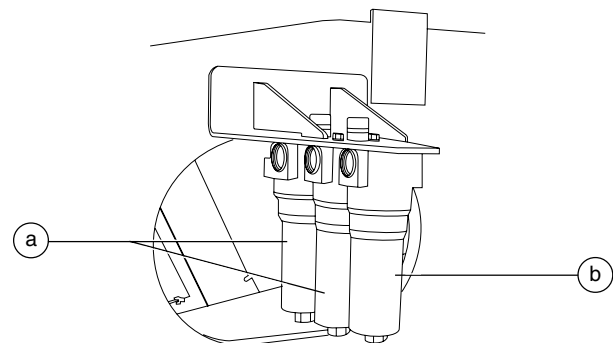
- 1 Open the ground controls side turntable cover and locate the hydraulic return filter mounted on the hydraulic tank.
- 2 Place a suitable container under the hydraulic tank return filter.

- 3 Remove the filter with an oil filter wrench.
- 4 Apply a thin layer of fresh oil to the gasket of the new oil filter.
- 5 Install the new hydraulic return filter element and tighten it securely by hand. Clean up any oil that may have spilled during the installation procedure.
- 6 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter.

Medium and high pressure filters**NOTICE**

The medium pressure filter is for the charge pump. One high pressure filter is for all boom and steer functions. The other high pressure filter is for the oscillating axle circuit and platform manifold.

- 7 Open the engine side turntable cover and locate the three filters mounted to the bulkhead.



- a high pressure filters
b medium pressure filter

REV C

CHECKLIST D PROCEDURES

- 8 Place a suitable container under the filters.
- 9 Remove the filter housing by using a wrench on the nut provided on the bottom of the housing.
- 10 Remove the filter element from the housing.
- 11 Inspect the housing seal and replace it if necessary.
- 12 Install the new medium and high pressure filter elements into the housings and tighten them securely.
- 13 Clean up any oil that may have spilled during the installation procedure.
- 14 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter housings.
- 15 Start the engine from the ground controls.
- 16 Inspect the filter housings and related components to be sure that there are no leaks.

Checklist E Procedures

REV C

E-1

Test or Replace the Hydraulic Oil



Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often.

NOTICE

Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.**

NOTICE

Perform this procedure with the boom in the stowed position.

- 1 **GM and Ford models:** Turn the valve on the LPG tank clockwise to the off position (if equipped). Then slowly disconnect the hose from the LPG tank.
- 2 **GM and Ford models:** Open the clamps from the LPG tank straps and remove the LPG tank from the machine (if equipped).
- 3 **Models with hydraulic tank shut-off valves:** Locate the two hydraulic tank valves at the hydraulic tank through the access hole underneath the turntable. Close the valves.

- 4 Place a suitable container underneath the hydraulic tank.
- 5 Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.
- 6 Tag, disconnect and plug the two suction hoses and supply hose for the auxiliary pump from the hydraulic tank. Cap the fittings on the tank.

NOTICE

The hoses can be accessed through the access hole under the turntable.

- 7 Tag, disconnect and plug the return filter hydraulic hose at the return filter. Cap the fitting on the filter housing.
- 8 Remove the ground controls side turntable cover.
- 9 Support the hydraulic tank with an appropriate lifting device.
- 10 Remove the hydraulic tank mounting fasteners.
- 11 Remove the hydraulic tank from the machine.

WARNING

Crushing hazard. The hydraulic tank could become unbalanced and fall if not properly supported when removed from the machine.

- 12 Remove the hydraulic return filter housing mounting fasteners. Remove the hydraulic return filter housing from the hydraulic tank.
- 13 Remove the suction strainers from the tank and clean them using a mild solvent.

REV C

CHECKLIST E PROCEDURES

- 14 Rinse out the inside of the tank using a mild solvent.
- 15 Install the suction strainers using a thread sealant on the threads.
- 16 Install the drain plug using a thread sealant on the threads.
- 17 Install the hydraulic return filter housing onto the hydraulic tank.
- 18 Install the hydraulic tank onto the machine.
- 19 Install the two suction hoses to the suction strainers.
- 20 Install the supply hose for the auxiliary power unit and the return filter hose.

Models with hydraulic tank shut-off valves:

- 21 Open the two hydraulic tank valves at the hydraulic tank.
- 22 Fill the tank with hydraulic oil until the level is within the top 2 inches / 5 cm of the sight gauge. Do not overfill.
- 23 Clean up any oil that may have spilled.

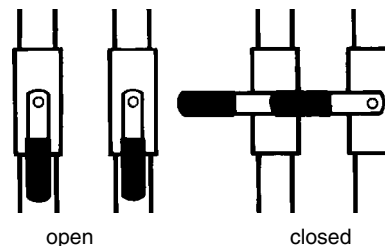
- 24 Prime the pump. Refer to Repair Procedure 7-2, *How to Prime the Pump*.

NOTICE

Always use pipe thread sealant when installing the suction hose fittings and the drain plug.

CAUTION

Component damage hazard. The engine must not be started with the hydraulic tank shut-off valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



CHECKLIST E PROCEDURES

REV C

E-2**Grease the Steer Axle
Wheel Bearings, 2WD Models**

Maintaining the steer axle wheel bearings is essential for safe machine operation and service life. Operating the machine with loose or worn wheel bearings may cause an unsafe operating condition and continued use may result in component damage. Extremely wet or dirty conditions or regular steam cleaning and pressure washing of the machine may require that this procedure be performed more often.

- 1 Loosen the wheel lug nuts. Do not remove them.
- 2 Block the non-steer wheels, then center a lifting jack with a minimum capacity of 25,000 lbs / 12000 kg under the drive chassis between the steer wheels.
- 3 Raise the machine 6 inches / 15 cm and place blocks under the drive chassis for support.
- 4 Select a wheel. Remove the lug nuts, and remove the tire and wheel assembly.
- 5 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.
- ⦿ Result: There should be no side to side or up and down movement.

Skip to step 10 if there is no movement.

- 6 Remove the dust cap from the hub, then remove the cotter pin from the castle nut.
- 7 Tighten the castle nut to 35 ft-lbs / 47 Nm to seat the bearings.
- 8 Fully loosen the castle nut, then re-tighten to 8 ft-lbs / 11 Nm.
- 9 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.
- ⦿ Result: If there is side to side or up and down movement, continue to step 11 and replace the wheel bearings with new ones.

NOTICE

When replacing a wheel bearing, both the inner and outer bearings, including the pressed-in races, must be replaced.

- ⦿ Result: If there is no side to side or up and down movement, continue with step 11 and grease the wheel bearings.
- 10 Remove the dust cap from the hub, then remove the cotter pin from the castle nut.
- 11 Remove the castle nut.
- 12 Pull the hub off of the spindle. The washer and outer bearing should fall loose from the hub.
- 13 Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.
- 14 Pack both bearings with clean, fresh grease.

REV C

CHECKLIST E PROCEDURES

15 Place the large inner bearing into the rear of the hub.

16 Install a new bearing grease seal into the hub by pressing it evenly into the hub until it is flush.

NOTICE Always replace the bearing grease seal when removing the hub.

17 Slide the hub onto the yoke spindle.

CAUTION Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.

18 Place the outer bearing into the hub.

19 Install the washer and castle nut.

20 Tighten the slotted nut to 35 ft-lbs / 47 Nm to seat the bearings.

21 Fully loosen the castle nut, then re-tighten to 8 ft-lbs / 11 Nm.

22 Install a new cotter pin. Bend the cotter pin to lock it in.

NOTICE Always replace the cotter pin with a new one when removing the castle nut or when checking the torque of the castle nut.

23 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to specification. Refer to Section 2, *Specifications*.

24 Repeat this procedure for the other wheels beginning with step 4.

E-3

Perform Engine Maintenance



NOTICE Engine specifications require that this procedure be performed every 2000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341).

Deutz 913 Operation Manual

Genie part number	62446
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Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook

Genie part number	101840
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Perkins 804C-33 Operation and Maintenance Manual

Genie part number	111332
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CHECKLIST E PROCEDURES

REV C

Ford Models

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook

Genie part number

84792

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠ WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

E-4**Perform Engine Maintenance - Ford Models****NOTICE**

Engine specifications require that this procedure be performed every 2400 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Ford Models

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook

Genie part number

84792

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠ WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

REV C

CHECKLIST E PROCEDURES

E-5**Perform Engine Maintenance - Diesel Models****NOTICE**

Engine specifications require that this procedure be performed every 3000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz 913 Operation Manual

Genie part number 62446

Deutz BF4L2011 Operation Manual

Genie part number 84794

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook

Genie part number 101840

Perkins 804C-33 Operation and Maintenance Manual

Genie part number 111332

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠ WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST E PROCEDURES

REV C

E-6**Perform Engine Maintenance -
Deutz Models****NOTICE**

Engine specifications require that this procedure be performed every 5000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz BF4L2011 Operation Manual

Genie part number

84794

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

WARNING

Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

REV C

CHECKLIST E PROCEDURES

E-7 Perform Engine Maintenance - Deutz Models



NOTICE Engine specifications require that this procedure be performed every 6000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz BF4L2011 Operation Manual

Genie part number 84794

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

AWARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

E-8 Perform Engine Maintenance - Deutz Models



NOTICE Engine specifications require that this procedure be performed every 12000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

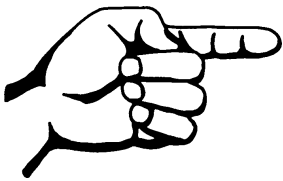
Deutz BF4L2011 Operation Manual

Genie part number 84794

To access the engine:

- 1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.
- 2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

AWARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.



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Repair Procedures



Observe and Obey:

- ☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Repairs Start:

- ☑ Read, understand and obey the safety rules and operating instructions in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
 - Machine parked on a firm, level surface
 - Boom in the stowed position
 - Turntable rotated with the boom between the circle-end (yellow arrow) wheels
 - Turntable secured with the turntable rotation lock pin
 - Key switch in the off position with the key removed
 - Wheels chocked
 - All external AC power supply disconnected from the machine

About This Section

Most of the procedures in this section should only be performed by a trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem.

Perform disassembly procedures to the point where repairs can be completed. To re-assemble, perform the disassembly steps in reverse order.

Symbols Legend



Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

With safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

CAUTION

Without safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE

Used to indicate operation or maintenance information.

- ⦿ Indicates that a specific result is expected after performing a series of steps.
- ✗ Indicates that an incorrect result has occurred after performing a series of steps.

Display Module

REV B

This table lists the various screens and menu options of the operating software. Some display menus are for informational purpose only, while others can be used to change the machine operating parameters.

The key switch must be in the off position before entering the programming mode.

Screen or Menu	Procedure	Description	Range
Operator	Default	Hour meter Engine speed Engine oil pressure PSI Engine oil pressure kPa Engine temperature °F Engine temperature °C Primary boom angle sensor Turntable level sensor X° Turntable level sensor Y° Platform angle Battery voltage	
Machine Status	With key switch ON, press the $\uparrow$ and $\downarrow$ at the same time.	Hydraulic pressure PSI Hydraulic pressure kPa Primary boom angle Primary boom length Secondary boom angle Secondary boom length	0-4500 PSI 0-31000 kPa 0-65 DEG = 0', >0', >22' = 0 DEG, >0 DEG, = 65 DEG, = 0 FT, > 0 FT
Unit of Measure and Language	With the key switch OFF, press and hold the $\uparrow$ button and turn the key switch to the ON position. Release the $\uparrow$ button and press $\uparrow$ $\downarrow$ $\downarrow$ $\uparrow$.	Metric/English measurements Language selection	English, German, French, Spanish, Portuguese, Italian, Dutch, and Swedish.
Drive Functions	With the key switch OFF, press and hold the $\uparrow$ button and turn the key switch to the ON position. Release the $\uparrow$ button and press $\uparrow$ $\uparrow$ $\downarrow$ $\downarrow$.	Forward not stowed drive speed % Forward low drive speed % Forward high drive speed % Reverse not stowed drive speed % Reverse low drive speed % Reverse high drive speed % Drive acceleration % Drive deceleration % Speed limit on steer angle	120% (default) 50% min 120% (default) 50% min 120% max and 50% min, 100% (default) 120% max and 50% min, 100% (default) 120% max and 50% min, 100% (default) 120% max and 50% min, 100% (default) 120% max and 50% min, 100% (default) 120% max and 50% min, 100% (default) 120% max and 50% min, 100% (default) 100% max and 0% min, 75% (default)

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DISPLAY MODULE

Screen or Menu	Procedure	Description	Range
Boom Function Speeds	With the key switch OFF, press and hold the  button and turn the key switch to the ON position. Release the  button and press     .	Primary boom up speed % (stowed)	120% max and 50% min, 100% (default)
		Primary boom up speed % (raised)	120% max and 50% min, 100% (default)
		Primary boom down speed % (stowed)	120% max and 50% min, 100% (default)
		Primary boom down speed % (raised)	120% max and 50% min, 100% (default)
		Primary boom extend speed %	120% max and 50% min, 100% (default)
		Primary boom retract speed %	120% max and 50% min, 100% (default)
		Secondary boom up speed % (stowed)	120% max and 50% min, 100% (default)
		Secondary boom up speed % (raised)	120% max and 50% min, 100% (default)
		Secondary boom down speed % (stowed)	120% max and 50% min, 100% (default)
		Secondary boom down speed % (raised)	120% max and 50% min, 100% (default)
		Secondary boom extend speed %	120% max and 50% min, 100% (default)
		Secondary boom retract speed %	120% max and 50% min, 100% (default)
		Turntable rotate speed % (retracted)	120% max and 50% min, 100% (default)
		Turntable rotate speed % (extended)	120% max and 50% min, 100% (default)
		Jib boom up/down speed %	120% max and 50% min, 100% (default)

DISPLAY MODULE

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Screen or Menu	Procedure	Description	Range
Lift Function Ramp Settings	With the key switch OFF, press and hold the  button and turn the key switch to the ON position. Release the  button and press     .	Primary boom up/down ramp acceleration %	150% max and 50% min, 100% (default)
		Primary boom up/down ramp deceleration %	150% max and 50% min, 100% (default)
		Primary boom extend/retract ramp acceleration %	150% max and 50% min, 100% (default)
		Primary boom extend/retract ramp deceleration %	150% max and 50% min, 100% (default)
		Secondary boom ramp acceleration %	150% max and 50% min, 100% (default)
		Secondary boom ramp deceleration %	150% max and 50% min, 100% (default)
		Turntable rotate ramp acceleration %	150% max and 50% min, 100% (default)
		Turntable rotate ramp deceleration %	150% max and 50% min, 100% (default)
		Jib boom up/down ramp deceleration %	150% max and 50% min, 100% (default)

REV B

DISPLAY MODULE

Screen or Menu	Procedure	Description	Range
Valve Calibration	With the key switch OFF, press and hold the  button and turn the key switch to the ON position. Release the  button and press     .	Reset drive valve defaults Reset primary boom up/down valve defaults Reset primary boom extend/retract valve defaults Reset secondary boom valve defaults Reset turntable rotate valve defaults Allow primary boom up/down speed calibration Allow primary boom extend/retract speed calibration Allow secondary boom up/down speed calibration Allow turntable rotate speed calibration Reset drive joystick defaults Reset primary boom up/down joystick defaults Reset primary boom extend/retract joystick defaults Reset secondary boom joystick defaults Reset turntable rotate joystick defaults Reset steer joystick defaults	

DISPLAY MODULE

REV B

Screen or Menu	Procedure	Description	Range
Sensor Calibration	With the key switch OFF, press and hold the  button and turn the key switch to the ON position. Release the  button and press     .	Set unit levels to gravity Unit level Y-axis millivolts per degree Unit level X-axis millivolts per degree Set platform level to gravity Platform level sensor millivolts per degree Reset blue end blue side steer sensor (YES/NO) Reset yellow end blue side steer sensor (YES/NO) Reset blue end yellow side steer sensor (YES/NO) Reset yellow end yellow side steer sensor (YES/NO) Reset all steer sensors (YES/NO) Reset primary boom angle sensor (YES/NO) Primary boom angle = 35 deg (YES/NO) Primary boom angle = 65 deg (YES/NO)	
Default Reset	With the key switch OFF, press and hold the  button and turn the key switch to the ON position. Release the  button and press     .	Reset drive functions Reset boom functions Reset lift function ramps Reset all	

REV B

DISPLAY MODULE

Screen or Menu	Procedure	Description	Range
Options	With the key switch OFF, press and hold the  button and turn the key switch to the ON position. Release the  button and press     .	Boom length limit: No limit (NO LT) Secondary boom extend disabled: (EXT LT) Secondary boom function disabled: (SEC LT) AC generator: (NO/BELT/HI_LO/HYDRL) Alarm: NO, Motion (MO AL), Travel (TR AL), Descent (DE AL) Travel and Decent (TD AL) Lift/drive cut outs: No (NO CO) Drive cutout while not stowed (DCONS), Lifting or Driving (LORDR) Auxiliary drive OPT: (YES/NO) Proximity kill switch OR Platform overload sensing: (OVERLOAD/NONE/PROX/PLTFS) Work light: (YES/NO) Flashing beacon: (YES/NO) Drive lights: (YES/NO) Disable steer mode change while driving: (YES/NO) Rocker joystick steering (YES/NO) Chassis Tilt Cutout (YES/NO) Foot Switch Lockout, 0 to 30 minutes Generator Off Delay, 0 to 10 seconds	0 to 30 minutes (holding  or  button will cause display to scroll through options or increment number settings).

Platform Controls

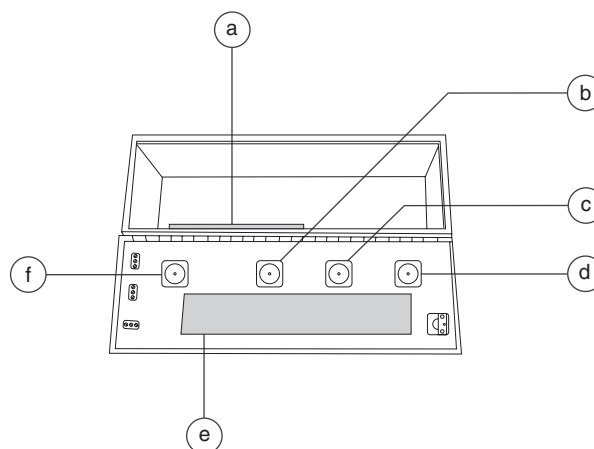
REV B

The platform controls contains two printed circuit boards:

The **LED circuit board** is mounted to the underside of the control box lid which contains the LED's. The LED circuit board sends the input from the operator to the platform controls ECM circuit board (PCON). The ECM circuit board (PCON) sends the data to the turntable control box (TCN) for processing.

The **platform controls ECM circuit board (ALC-1000)** communicates with the turntable controls. The joystick controllers at the platform controls utilize Hall Effect technology and require no adjustment. The operating parameters of the joysticks are stored in memory at the turntable controls. If a joystick controller error occurs or if a joystick is replaced, it will need to be calibrated before that particular machine function will operate. See 1-3, *How to Calibrate a Joystick*.

Each joystick controller should operate smoothly and provide proportional speed control over its entire range of motion.



- a platform controls ALC-1000 circuit board
- b primary boom extend/retract joystick
- c secondary boom up/extend and down/retract joystick
- d drive/steer joystick controller
- e LED circuit board
- f primary boom up/down and turntable rotate left/right joystick

REV B

PLATFORM CONTROLS

1-1

ALC-1000 Circuit Board

NOTICE

When the ALC-1000 circuit board is replaced, the joystick controllers will need to be calibrated. See 1-3, *How to Calibrate a Joystick*.

How to Remove the ALC-1000 Circuit Board

- 1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.
- 2 Locate the cables that connect to the bottom of the control box. Tag each cable and its location at the control box.
- 3 Disconnect the cables from the bottom of the platform control box.
- 4 Remove the control cable plug retaining fasteners from the bottom of the platform control box.
- 5 Remove the platform control box lid retaining fasteners. Open the control box lid.
- 6 Locate the ALC-1000 circuit board mounted to the inside of the platform control box.

- 7 Attach a grounded wrist strap to the ground screw inside the platform control box.

WARNING

Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

CAUTION

Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

- 8 Carefully disconnect the wire connectors from the circuit board.
- 9 Remove the ALC-1000 circuit board mounting fasteners.
- 10 Carefully remove the ALC-1000 circuit board from the platform control box.

How to Remove the LED Circuit Board

- 1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.
- 2 Remove the platform control box lid retaining fasteners. Open the control box lid.

PLATFORM CONTROLS

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- 3 Locate the LED circuit board mounted to the inside of the platform control box lid.

WARNING Electrocutation hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

- 4 Carefully tag and disconnect the two ribbon cables from the membrane circuit board.
- 5 Remove the LED circuit board retaining fasteners.
- 6 Carefully remove the LED circuit board from the platform control box lid.

1-2 Membrane Decal

How to Replace the Membrane Decal

The membrane decal is a special decal that consists of a decal with an electronic membrane on the backside. The membrane contains touch sensitive areas that, when pushed, activates the machine functions. The membrane buttons activate machine functions similar to toggle switches, but do not have any moving parts.

- 1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.
- 2 Remove the platform control box lid retaining fasteners. Open the control box lid.
- 3 Carefully tag and disconnect the two ribbon cables from the membrane circuit board.

WARNING Electrocutation hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

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PLATFORM CONTROLS

- 4 Close the control box lid.
- 5 Remove the platform controls decal from the platform control box.
- 6 Carefully remove the membrane decal from the platform control box while guiding the ribbon cables out of the control box lid.
- 7 Remove any decal adhesive from the control box lid with a mild solvent.

NOTICE Do not allow any solvent to come in contact with the membrane circuit board.

- 8 Install the new membrane decal while guiding the ribbon cables through the control box lid.

NOTICE Be sure that all LED locations on the membrane decal align with the LEDs on the membrane circuit board.

- 9 Install a new platform controls decal over the membrane decal.
- 10 Open the control box lid and carefully connect the ribbon cables from the membrane decal to the membrane circuit board.

1-3

Joysticks

How to Calibrate a Joystick

The joystick controllers on this machine utilize digital Hall Effect technology for proportional control. If a joystick controller is disconnected or replaced, it must be calibrated before that particular machine function will operate.

NOTICE The joystick must be calibrated before the threshold, max-out or ramping can be set.

NOTICE After each joystick is calibrated, check the display at the ground control box. There should be no calibration faults shown on the display. If calibration faults exist, repeat steps 1 through 8 for that joystick controlled function.

NOTICE Perform this procedure with the engine off.

Drive functions:

- 1 Turn the key switch to the off position.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to platform controls.
- 3 Press the minus button  twice, then press the enter button  twice.

PLATFORM CONTROLS

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- 4 Use the scroll button  to scroll through the menu until RESET DRIVE JOYSTICK DEFAULTS is displayed. Press the  button to select YES, then press the  button.
 - 5 Do not start the engine.
 - 6 Locate the drive/steer joystick.
 - 7 Move the drive/steer joystick full stroke in the forward direction and hold for 5 seconds, then return to the center or neutral position.
 - 8 Move the drive/steer joystick full stroke in the reverse direction and hold for 5 seconds, then return to the center or neutral position.
- ⊙ Result: The alarm at the ground controls should sound for a successful calibration.

Steer functions:

- 1 Turn the key switch to the off position.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to platform controls.
- 3 Press the minus button  twice, then press the enter button  twice.
- 4 Use the scroll button  to scroll through the menu until RESET STEER JOYSTICK DEFAULTS is displayed. Press the  button to select YES, then press the  button.
- 5 Do not start the engine.
- 6 Locate the drive/steer joystick.

- 7 Move the drive/steer joystick or thumb rocker switch (if equipped) full stroke in the left direction and hold for 5 seconds, then return to the center or neutral position.
 - 8 Move the drive/steer joystick or thumb rocker switch (if equipped) full stroke in the right direction and hold for 5 seconds, then return to the center or neutral position.
- ⊙ Result: The alarm at the ground controls should sound for a successful calibration.
- ✖ Result: If the alarm does not sound, repeat calibration procedure.

Primary boom extend/retract functions:

- 1 Turn the key switch to the off position.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to platform controls.
- 3 Press the minus button  twice, then press the enter button  twice.
- 4 Use the scroll button  to scroll through the menu until RESET PRIMARY BOOM EXTEND/RETRACT JOYSTICK DEFAULTS is displayed. Press the  button to select YES, then press the  button.
- 5 Do not start the engine.
- 6 Locate the primary boom extend/retract joystick.

REV B

PLATFORM CONTROLS

- 7 Move the primary boom extend/retract joystick full stroke in the extend direction and hold for 5 seconds, then return to the center or neutral position.
- 8 Move the primary boom extend/retract joystick full stroke in the retract direction and hold for 5 seconds, then return to the center or neutral position.
- ⦿ Result: The alarm at the ground controls should sound for a successful calibration.
- ✗ Result: If the alarm does not sound, repeat calibration procedure.

Secondary boom up/down and extend/retract functions:

- 1 Turn the key switch to the off position.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to platform controls.
- 3 Press the minus button  twice, then press the enter button  twice.
- 4 Use the scroll button  to scroll through the menu until RESET SECONDARY BOOM JOYSTICK DEFAULTS is displayed. Press the  button to select YES, then press the  button.
- 5 Do not start the engine.
- 6 Locate the secondary boom up/down and extend/retract joystick.

- 7 Move the secondary boom up/down and extend/retract joystick full stroke in the up/extend direction and hold for 5 seconds, then return to the center or neutral position.
- 8 Move the secondary boom up/down and extend/retract joystick full stroke in the down/retract direction and hold for 5 seconds, then return to the center or neutral position.
- ⦿ Result: The alarm at the ground controls should sound for a successful calibration.
- ✗ Result: If the alarm does not sound, repeat calibration procedure.

Primary boom up/down functions:

- 1 Turn the key switch to the off position.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to platform controls.
- 3 Press the minus button  twice, then press the enter button  twice.
- 4 Use the scroll button  to scroll through the menu until RESET PRIMARY BOOM UP/DOWN JOYSTICK DEFAULTS is displayed. Press the  button to select YES, then press the  button.
- 5 Do not start the engine.
- 6 Locate the primary boom/turntable rotate joystick.
- 7 Move the boom/turntable rotate joystick full stroke in the up direction and hold for 5 seconds, then return to the center or neutral position.

PLATFORM CONTROLS

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- 8 Move the boom/turntable rotate joystick full stroke in the down direction and hold for 5 seconds, then return to the center or neutral position.
- ⦿ Result: The alarm at the ground controls should sound for a successful calibration.
- ✗ Result: If the alarm does not sound, repeat calibration procedure.

Turntable rotate functions:

- 1 Turn the key switch to the off position.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to platform controls.
- 3 Press the minus button  twice, then press the enter button  twice.
- 4 Use the scroll button  to scroll through the menu until RESET TURNTABLE ROTATE LEFT/RIGHT JOYSTICK DEFAULTS is displayed. Press the  button to select YES, then press the  button.
- 5 Do not start the engine.
- 6 Locate the primary boom/turntable rotate joystick.
- 7 Move the boom/turntable joystick full stroke in the left direction and hold for 5 seconds, then return to the center or neutral position.

- 8 Move the boom/turntable joystick full stroke in the right direction and hold for 5 seconds, then return to the center or neutral position.
- ⦿ Result: The alarm at the ground controls should sound for a successful calibration.
- ✗ Result: If the alarm does not sound, repeat calibration procedure.

How to Reset a Proportional Valve Coil Default

NOTICE This procedure only needs to be performed if a proportional valve has been replaced.

NOTICE After the valve coil defaults have been set, each machine function threshold and default function speed must be set. See 1-3, *How to Set the Function Thresholds and Default Function Speeds*.

- 1 Turn the key switch to the off position.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to platform controls.
- 3 Press the minus button  twice, then press the enter button  twice.
- 4 Use the scroll button  to scroll through the menu until the function valve that needs to be reset is displayed. Press the  button to select YES, then press the  button.

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PLATFORM CONTROLS

How to Set the Function Thresholds and Default Functions Speeds

NOTICE

Before the threshold and default function speeds can be set, the boom function proportional valve coil defaults must be set first. See 1-3, *How to Reset a Proportional Valve Coil Default*.

NOTICE

If a boom function proportional valve coil has not been replaced and just want to reset the function speed to original factory settings, begin with step 10.

NOTICE

Perform this procedure with the machine parked on a firm, level surface which is free of obstructions.

- 1 Start the engine from the platform controls.
- 2 Press down the foot switch.

NOTICE

Be sure the engine rpm is set to foot switch activated high idle.

Function threshold:

- 3 Select a joystick controlled function that needs to have the threshold set.
- 4 Slowly move the joystick off center in either direction just until the machine function starts to move, then move the joystick very slowly towards the neutral or center position just before the machine function stops. Do not let go of the joystick.

- 5 While holding the joystick in position, press the engine start button  at the platform controls to set the joystick controller threshold.
- 6 Repeat steps 3 through 5 for each joystick controlled machine function (primary boom up/down and turntable rotate left/right, primary boom extend/retract, secondary up/down and extend/retract, drive forward/reverse and steer left/right).
- 7 Once the threshold has been set, press and hold the engine start button  until the engine shuts off. Do not press the red Emergency Stop button.

NOTICE

Approximately 3 seconds after the engine shuts off, the alarm at the ground controls will sound to indicate the threshold settings are being saved in memory. Release the button.

- 8 At the ground controls, turn the key switch to the off position, wait a moment and then turn the key switch to platform controls.
- 9 Check the display at the ground controls to be sure there are no calibration faults.
- ① Result: There should be no calibration faults shown on the display. If calibration faults exist, repeat this procedure.

Function speeds:**NOTICE**

Be sure the machine is in the stowed position and the boom is rotated between the square end tires.

PLATFORM CONTROLS

REV B

10 Start the engine from the platform controls.

11 Select a boom function that needs the function speed set.

12 Boom up/down and extend/retract

functions: Move the joystick full stroke in the up or extend direction. When the alarm sounds, move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

Turntable rotate functions: Move the joystick full stroke in either the left or right direction. When the alarm sounds, move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

13 Once the function speeds have been set, press and hold the engine start button  until the engine shuts off. Do not press the red Emergency Stop button.

NOTICE Approximately 3 seconds after the engine shuts off, the alarm at the ground controls will sound to indicate the speed settings are being saved in memory. Release the button.

14 At the ground controls, turn the key switch to the off position, wait three seconds and then turn the key switch to platform controls.

15 Inspect the display at the ground controls to be sure there are no calibration faults.

NOTICE There should be no calibration faults shown on the display. If calibration faults exist, repeat this procedure.

How to Adjust the Function Speeds

NOTICE Perform this procedure with the boom in the stowed position. Refer to Section 2, *Specifications*.

- 1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to ground controls.
- 3 Press the plus button  twice, then press the minus button  twice.
- 4 Press the scroll button  until the function to be adjusted is displayed.
- 5 Press the plus button  to increase the speed or press the minus button  to decrease the speed.
- 6 Press the enter button  to save the setting in memory.
- 7 Perform this procedure until the machine function speed meets specification.

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PLATFORM CONTROLS

How to Adjust the Function Ramp Rate Setting

The ramp rate setting of a joystick controls the time at which it takes for the joystick to reach maximum output, when moved out of the neutral position. The ramp rate settings of a joystick can be changed to compensate for hydraulic pump wear to maintain peak performance from the machine. Refer to Section 2, *Specifications*.

NOTICE Perform this procedure with the boom in the stowed position.

- 1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 2 Press and hold the enter button  on the ground control panel while turning the key switch to ground controls.
- 3 Press the plus button  twice, then press the scroll button  twice.
- 4 Press the scroll button  until the function to be adjusted is displayed.
- 5 Press the plus button  to increase the ramp rate or press the minus button  to decrease the ramp rate.
- 6 Press the enter button  to save the setting in memory.
- 7 Perform this procedure until the machine function speed meets specification.

Ramp Rate Specifications

Ramp rate (factory settings)

Primary boom and turntable rotate

accelerate	4 seconds
decelerate	1 second

Primary boom extend/retract

accelerate	3 seconds
decelerate	0.75 second

Secondary boom up/down

accelerate	7 seconds
decelerate	0.75 second

Secondary boom extend/retract

accelerate	8 seconds
decelerate	1 second

Drive

accelerate	2.5 seconds
decelerate to neutral	0.75 second
decelerate, change of direction	0.75 second
decelerate, coasting	1 second
decelerate, braking	1.5 seconds
decelerate, shift from low to high speed	1 second
decelerate, shift from high to low speed	4 seconds

Platform Components

REV B

2-1 Platform

How to Remove the Platform

- 1 Separate the foot switch quick disconnect plug.
- 2 Support the platform with an appropriate lifting device.
- 3 Locate the cables that connect to the bottom of the control box. Number each cable and its location at the platform control box.
- 4 Disconnect the cables from the bottom of the platform control box.
- 5 Remove the platform control box mounting fasteners. Remove the platform control box and set it aside.
- 6 Remove the air line to platform bracket retaining fasteners (if equipped).
- 7 Remove the weld cables from the platform (if equipped).
- 8 Remove the platform mounting fasteners and remove the platform from the machine.

⚠ WARNING Crushing hazard. The platform could become unbalanced and fall when it is removed from the machine if it is not properly supported.

2-2 Platform Leveling Cylinder

The platform leveling cylinder maintains platform leveling through the entire range of boom motion. This allows the platform to be level with the turntable. The ECM at the ground controls compares the difference in readings between the platform angle sensor and the turntable level sensor. The ECM at the ground controls sends a signal to the platform controls to open or close the appropriate platform level proportional valve on the platform manifold to maintain a level platform. The platform leveling cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Platform Leveling Cylinder

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Extend the boom until the platform leveling cylinder barrel-end pivot pin is accessible.
- 2 Raise the jib boom slightly and place blocks under the platform.

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PLATFORM COMPONENTS

- 3 Lower the jib boom until the platform is resting on the blocks just enough to support the platform.

NOTICE

Do not rest the entire weight of the boom on the blocks.

- 4 Tag, disconnect and plug the hydraulic hoses from the platform leveling cylinder at the bulkhead fittings located inside the boom tube at the platform end. Cap the bulkhead fittings on the boom tube.

WARNING

Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 5 Remove the pin retaining fasteners from the platform leveling cylinder rod-end pivot pin. Do not remove the pin.
- 6 Remove the external snap rings from the barrel-end pivot pin. Do not remove the pin.
- 7 Support and secure the jib boom cylinder to the jib boom with a strap or other suitable device. Protect the cylinder rod from damage.

CAUTION

Crushing hazard. The jib boom cylinder will fall if not properly supported when the platform level cylinder rod-end pivot pin is removed.

- 8 Use a soft metal drift to remove the barrel-end pivot pin.

WARNING

Crushing hazard. The platform and jib boom will fall when the platform leveling cylinder barrel-end pivot pin is removed if not properly supported.

- 9 Support the rod end of the platform level cylinder.
- 10 Use a soft metal drift to tap the platform level cylinder rod-end pivot pin half way out and lower one of the leveling arms to the ground. Tap the pin the other direction and lower the opposite leveling arm. Do not remove the pin.
- 11 Use a soft metal drift to remove the platform level cylinder rod-end pivot pin.
- 12 Carefully pull the platform leveling cylinder out of the boom.

CAUTION

Crushing hazard. The jib boom cylinder will fall if not properly supported when the platform level cylinder rod-end pivot pin is removed.

How to Bleed the Platform Leveling Cylinder

NOTICE

Do not start the engine. Use auxiliary power for all machine functions in this procedure.

- 1 Raise the jib boom to a horizontal position.
- 2 Push the platform level up and down buttons through two complete platform leveling cycles to remove any air that might be in the system.

PLATFORM COMPONENTS

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2-3**Platform Rotator**

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 160 degrees.

How to Remove the Platform Rotator

CAUTION Component damage hazard. Mark the platform mounting weldment and the rotator flange before removing the platform mounting weldment. The platform mounting weldment must be replaced in the exact same position on the rotator flange as it was before removal. If a new rotator is installed or the rotator is disassembled, proper alignment can be achieved by rotating the rotator all the way to the left and then installing the platform mounting weldment all the way in the left position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform. See 2-1, *How to Remove the Platform*.

- 2 Disconnect the wire harness from the platform angle sensor.
- 3 Tag, disconnect and plug the hydraulic hoses from the platform rotator manifold. Cap the fittings on the manifold.

WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 4 Remove the hose and cable clamp from the platform support.
- 5 Remove the platform manifold mounting fasteners. Lay the platform manifold to the side.

CAUTION Component damage hazard. Cables can be damaged if they are kinked or pinched.

- 6 Remove the power to platform electrical outlet box bracket mounting fasteners.
- 7 Remove the power to platform electrical outlet box from the platform and lay it to the side.
- 8 Remove the weld cable from the platform (if equipped).

WARNING Electrocutation hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

REV B

PLATFORM COMPONENTS

- 9 Support the platform mounting weldment. Do not apply any lifting pressure.
- 10 Remove the eight mounting bolts from the platform mounting weldment.
- 11 Remove the center bolt and slide the platform mounting weldment off of the platform rotator.

⚠ WARNING Crushing hazard. The platform mounting weldment may become unbalanced and fall if it is not properly supported.

- 12 Support the platform rotator. Do not apply any lifting pressure.
- 13 Remove the pin retaining fasteners from the jib boom and jib boom leveling arms to platform rotator pivot pins. Do not remove the pins.
- 14 Support the jib boom leveling arms with a suitable lifting device.
- 15 Use a soft metal drift to remove both pins and remove the platform rotator from the machine.

⚠ WARNING Crushing hazard. The jib boom leveling arms may fall if they are not properly supported when the jib boom leveling arm pivot pin is removed.

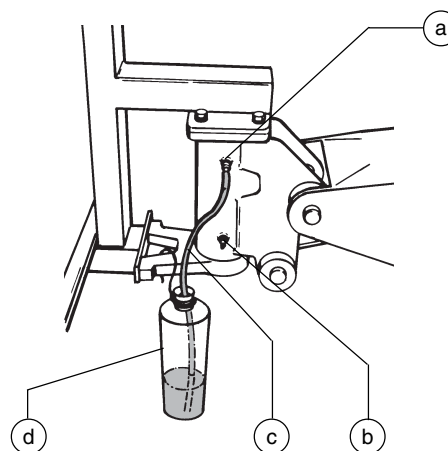
CAUTION Component damage hazard. The platform angle sensor is a very sensitive instrument. It can be damaged internally if the platform rotator is dropped or sustains any physical shock, even if the damage is not visible.

How to Bleed the Platform Rotator

Before serial number 229:

NOTICE Do not start the engine. Use auxiliary power for all machine functions in this procedure.

- 1 Connect a clear hose to the top bleed valve. Place the other end of the hose in a container to collect any drainage. Secure the container to the boom.



- a top bleed valve
- b bottom bleed valve
- c clear hose
- d container

- 2 Move the platform rotate switch to the left and then to the right through two platform rotation cycles, continue holding the switch to the right until the platform is fully rotated to the right.

PLATFORM COMPONENTS

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- 3 Open the top bleed valve, but do not remove it.
- 4 Move the platform rotate switch to the left until the platform is fully rotated to the left. Continue holding the switch until air stops coming out of the bleed valve. Close the bleed valve.

WARNING Crushing hazard. Keep clear of the platform during rotation.

- 5 Connect the clear hose to the bottom bleed valve. Open the bottom bleed valve, but do not remove it.
- 6 Hold the platform rotate switch to the right until the platform is fully rotated to the right. Continue holding the switch until air stops coming out of the bleed valve. Close the bleed valve.

WARNING Crushing hazard. Keep clear of the platform during rotation.

- 7 Remove the hose from the bleed valve and clean up any hydraulic oil that may have spilled.
- 8 Rotate the platform full right, then full left and inspect the bleed valves for leaks.

After serial number 228:

- 1 Rotate the platform full right, then full left until air is completely out of the rotator. Bleeding the valve is not necessary.

WARNING Crushing hazard. Keep clear of the platform during rotation.

2-4**Platform Overload System****How to Calibrate the Platform Overload System (if equipped)**

Calibration of the platform overload system is essential to safe machine operation. Continued use of an improperly calibrated platform overload system could result in the system failing to sense an overloaded platform. The stability of the machine is compromised and it could tip over.

NOTICE Perform this procedure with the machine on a firm, level surface.

- 1 Turn the key switch to platform control. Start the engine and level the platform.
- 2 Determine the maximum platform capacity. Refer to the machine serial plate.
- 3 Remove all weight, tools and accessories from the platform.

NOTICE Failure to remove all weight, tools and accessories from the platform will result in an incorrect calibration.

- 4 Using a suitable lifting device, place a test weight equal to the maximum platform capacity at the center of the platform floor.

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PLATFORM COMPONENTS

- 5 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

☉ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Proceed to step 6.

⊗ Result: The alarm is sounding. The platform overload indicator light is flashing at the platform controls and “PLATFORM OVERLOAD” should be displayed on the LCD screen at the ground controls. Slowly tighten the load spring adjustment nut in a clockwise direction in 10° increments until the overload indicator light turns off, and the alarm does not sound. Proceed to step 8.

NOTICE The platform will need to be moved up and down and allowed to settle between each adjustment.

NOTICE There may be a 2 second delay before the platform overload indicator light and alarm responds.

- 6 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

☉ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Slowly loosen the load spring adjustment nut in a counterclockwise direction in 10° increments until the overload indicator light flashes at both the platform and ground controls, and the alarm sounds. Proceed to step 7.

⊗ Result: The alarm should be sounding. The platform overload indicator light should be flashing at the platform controls and “PLATFORM OVERLOAD” should be displayed on the LCD screen at the ground controls. Repeat this procedure beginning with step 5.

NOTICE The platform will need to be moved up and down and allowed to settle between each adjustment.

NOTICE There may be a 2 second delay before the platform overload indicator lights and alarm responds.

PLATFORM COMPONENTS

REV B

- 7 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Proceed to step 8.

✗ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Repeat this procedure beginning with step 5.

NOTICE There may be a 2 second delay before the platform overload indicator light and alarm responds.

- 8 Add an additional 10 lb / 4.5 kg test weight to the platform.

⊙ Result: The alarm should be sounding. The platform overload indicator light should be flashing at the platform controls and "PLATFORM OVERLOAD" should be displayed on the LCD screen at the ground controls. Proceed to step 9.

✗ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Remove the additional 10 lb / 4.5 kg test weight. Repeat this procedure beginning with step 6.

NOTICE There may be a 2 second delay before the platform overload indicator light and alarm responds.

- 9 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

- 10 Turn the key switch to ground control.

- 11 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should not operate.

- 12 Using a suitable lifting device, lift the test weight off the platform floor.

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls.

NOTICE There may be a 2 second delay before the overload indicator lights and alarm turn off.

- 13 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should operate normally.

- 14 Turn the key switch to platform control.

- 15 Test all machine functions from the platform controls.

⊙ Result: **Only for software versions 1.03 and lower.** All ground control functions should not operate. Refer to Repair Procedure 6-1, *How to Determine the Revision Level*.

⊙ Result: **Only for software versions 1.04 and higher.** All ground control functions should still operate. Refer to Repair Procedure 6-1, *How to Determine the Revision Level*.

REV B

Jib Boom Components

3-1 Jib Boom

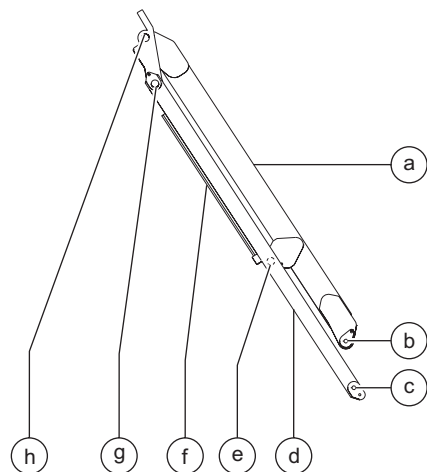
How to Remove the Jib Boom

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform mounting weldment and the platform rotator. See 2-3, *How to Remove the Platform Rotator*.
- 2 Remove the hose and cable cover retaining fasteners from the jib boom. Remove the hose and cable cover from the machine.
- 3 Attach a lifting strap from an overhead crane to the jib boom.
- 4 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.



- a jib boom
- b platform rotator upper pivot pin
- c platform rotator lower pivot pin
- d jib boom leveling arm
- e jib cylinder pivot pin
- f jib boom cylinder
- g primary boom lower pivot pin
- h primary boom upper pivot pin

JIB BOOM COMPONENTS

REV B

- 5 Support the barrel end of the cylinder with another suitable lifting device.
- 6 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin.
- 7 Use a soft metal drift to remove the pin and let the cylinder hang down.

⚠WARNING Crushing hazard. The jib boom could become unbalanced and fall if not properly supported when the jib boom lift cylinder barrel-end pivot pin is removed.

- 8 Secure the jib boom bellcrank to prevent it from moving.
- 9 Remove the hose and cable clamp from the jib boom pivot pin.
- 10 Remove the pin retaining fastener from the jib boom pivot pin. Do not remove the pin.
- 11 Place blocks under the platform leveling cylinder for support.
- 12 Use a soft metal drift to remove the pin. Carefully remove the jib boom from the primary boom.

⚠WARNING Crushing hazard. The jib boom could become unbalanced and fall if not properly supported when removed from the machine.

- 13 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.
- 14 Slide both of the jib boom leveling arms off of the jib boom cylinder rod-end pivot pin and lay them off to the side.
- 15 Attach a lifting strap from an overhead crane to the lug on the rod end of the jib boom lift cylinder.
- 16 Attach a lifting strap from a second overhead crane to the jib boom bellcrank.
- 17 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder and jib boom bellcrank from the machine.

⚠WARNING Crushing hazard. The jib boom lift cylinder and jib boom bellcrank could become unbalanced and fall if not properly supported when they are removed from the machine.

⚠CAUTION Crushing hazard. The platform leveling cylinder may fall if not supported when the rod-end pivot pin is removed.

REV B

JIB BOOM COMPONENTS

3-2 Jib Boom Lift Cylinder

How to Remove the Jib Boom Lift Cylinder

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the jib boom slightly and place blocks under the platform mounting weldment. Lower the jib boom until the platform is resting on the blocks just enough to support the platform.

NOTICE Do not rest the entire weight of the boom on the blocks.

- 2 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.
- 4 Use a soft metal drift to tap the jib boom lift cylinder rod-end pivot pin half way out and lower one of the leveling arms to the ground. Tap the pin the other direction and lower the opposite leveling arm. Do not remove the pin.

CAUTION Crushing hazard. The jib boom lift cylinder may fall if not supported when the rod-end pivot pin is removed.

- 5 Support the jib boom lift cylinder with a suitable lifting device.
- 6 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the barrel-end pivot pin and let the cylinder hang down.

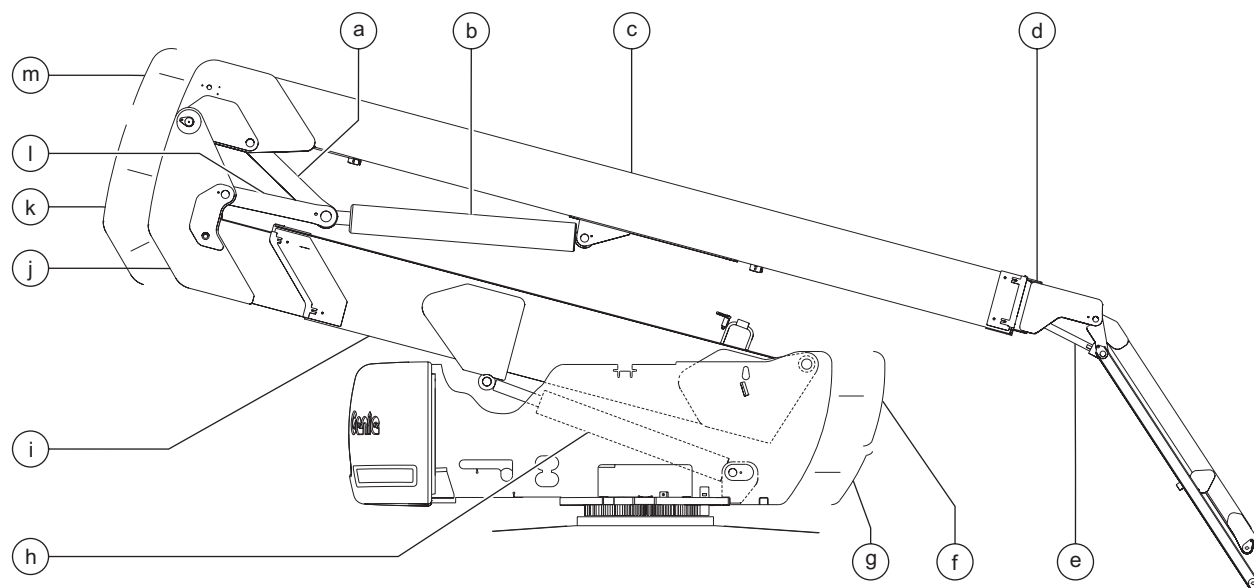
WARNING Crushing hazard. The platform and jib boom lift cylinder could become unbalanced and fall if not properly supported when the jib boom lift cylinder barrel-end lift pivot pin is removed.

- 7 Place blocks under the platform leveling cylinder for support.
- 8 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the machine.

WARNING Crushing hazard. The jib boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

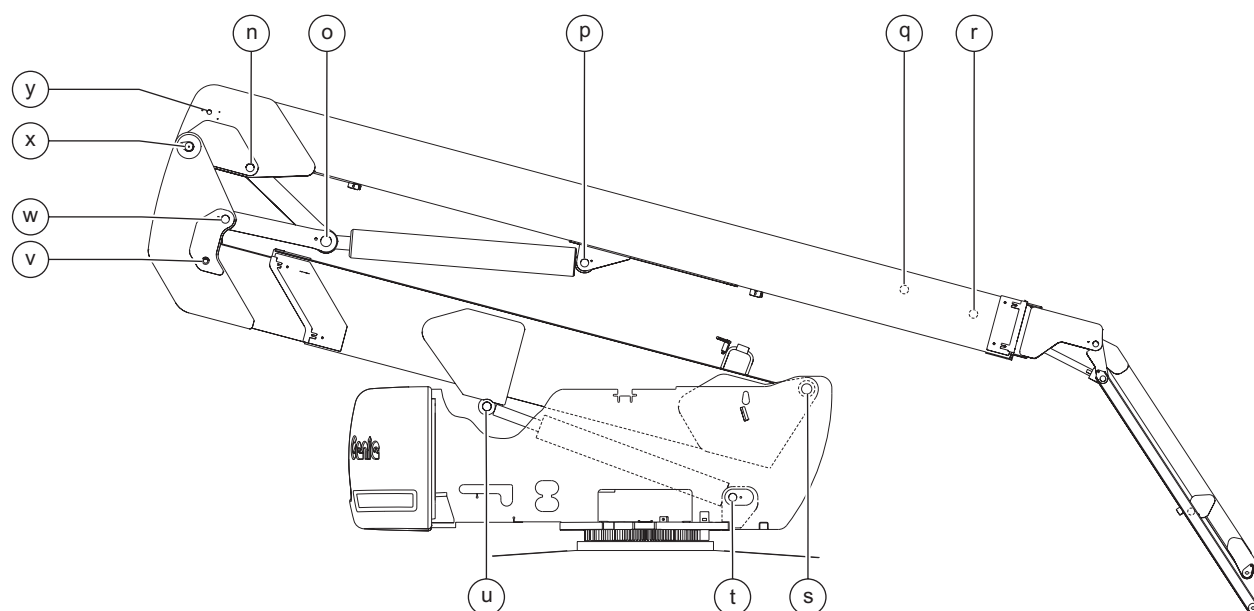
Boom Components

REV C



- a primary boom lift cylinder link arm
- b primary boom lift cylinder
- c primary boom
- d primary extension boom
- e platform leveling cylinder
- f upper turntable cover
- g lower turntable cover
- h secondary boom lift cylinder
- i secondary boom
- j secondary extension boom
- k secondary boom hose cover
- l primary boom lift cylinder lever arm

- m primary boom hose cover
- n primary boom link arm pivot pin
- o primary lift cylinder pivot pin - rod end
- p primary lift cylinder pivot pin - barrel end
- q primary extend cylinder pivot pin - rod end
- r platform level cylinder pivot pin - barrel end
- s secondary boom pivot pin
- t secondary lift cylinder pivot pin - barrel end
- u secondary lift cylinder pivot pin - rod end
- v secondary extend cylinder pivot pin - rod end
- w secondary boom lever arm pivot pin
- x primary boom pivot pin
- y primary extend cylinder pivot pins - barrel end



REV C

BOOM COMPONENTS

4-1 Primary Boom Cable Track

The primary boom cable track guides the cables and hoses running up the boom. It can be repaired link by link without removing the cables and hoses that run through it. Removing the entire primary boom cable track is only necessary when performing major repairs that involve removing the primary boom.

How to Remove the Cable Track

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Tag and disconnect the wire connectors from the platform control box.
- 2 Tag, disconnect and plug the hydraulic hoses from the counterbalance valve manifold located on the platform rotator. Cap the fittings on the manifold.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Remove the mounting fasteners from the outlet box. Remove the outlet box and lay to the side.
- 4 Remove the hose clamp from the platform support.
- 5 Tag and disconnect the electrical connector from the platform angle sensor.

NOTICE The platform angle sensor is mounted to the platform rotator.

- 6 Tag and disconnect the electrical connectors for the foot switch and jib boom limit switch.
- 7 Remove the platform manifold mounting fasteners. Remove the manifold and lay to the side.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

- 8 Remove the hose and cable cover retaining fasteners from the jib boom. Remove the hose and cable cover from the machine.
- 9 Remove the hose and cable clamp from the jib boom pivot pin.

⚠ CAUTION Crushing hazard. The jib boom may fall if not supported when the jib boom pivot pin is removed.

BOOM COMPONENTS

REV C

- 10 Tag, disconnect and plug the slave cylinder hydraulic hoses from the bulkhead fittings at the platform end of the primary boom. Cap the bulkhead fittings.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 11 Tag, disconnect and plug the jib boom cylinder hydraulic hoses. Cap the fittings.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 12 Remove the cotter pin from the platform end of the cable track tube.

NOTICE Always replace the cotter pin with a new one when installing the cable track.

- 13 Remove the fasteners from the cable track guide at the platform end of the primary boom. Remove the cable track guide from the machine.

- 14 Tag and disconnect the electrical connector from the limit switch at the pivot end of the primary boom.

- 15 Remove all hose clamps for the primary boom lift cylinder hydraulic hoses.

NOTICE The primary boom lift cylinder hydraulic hose clamps are located behind the cable track.

- 16 Support the end cover from the secondary boom at the pivot end of the primary boom.

- 17 Remove the cover retaining fasteners and remove the cover from the machine.

⚠ WARNING Crushing hazard. The secondary boom hose cover could become unbalanced and fall if not properly supported when removed from the machine.

- 18 Tag, disconnect and plug each hydraulic hose from the bulkhead fittings that lead to the cable track. Cap the fittings.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

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BOOM COMPONENTS

- 19 Tag and disconnect each electrical connector to wiring that leads to the cable track.
- 20 Pull all hoses and electrical cables through the opening in the primary boom at the pivot end.
- 21 Secure the upper and lower cable tracks together.
- 22 Attach a lifting strap from an overhead crane to the cable track.
- 23 Remove all cable track mounting fasteners.
- 24 Carefully remove the cable track from the machine and lay it on a structure capable of supporting it.

CAUTION Component damage hazard.
The boom cable track can be damaged if it is twisted.

CAUTION Component damage hazard.
Cables and hoses can be damaged if they are kinked or pinched.

How to Repair the Cable Track

CAUTION Component damage hazard.
The boom cable track can be damaged if it is twisted.

NOTICE A cable track repair kit is available through the Genie Industries Service Parts Department.

- 1 Visually inspect the cable track and determine which 4-link section needs to be replaced.
- 2 Carefully remove the snap rings from each end of the damaged section of cable track.
- 3 Remove the retaining fasteners from the upper black rollers from the 4-link section of cable track to be replaced. Remove the rollers.
- 4 Lift up the hoses and cables and carefully remove the damaged 4-link section of cable track.

CAUTION Component damage hazard.
Hoses and cables can be damaged if they are kinked or pinched.

- 5 Remove the upper rollers from the replacement section of cable track.
- 6 Lift up the hoses and cables and carefully insert the new 4-link section of cable track.

CAUTION Component damage hazard.
Hoses and cables can be damaged if they are kinked or pinched.

BOOM COMPONENTS

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- 7 Connect the ends of the replacement cable track section to the existing cable track using the snap rings.
- 8 Install the rollers onto the new section of cable track.
- 9 Operate the boom extend/retract function through a full cycle to ensure smooth operation of the cable track.

4-2 Primary Boom

How to Shim the Boom

- 1 Measure each wear pad.
 - ⓘ Result: Each wear pad meets minimum specification. Proceed to step 2.
 - ✖ Result: Each wear pad does not meet minimum specification. Replace any wear pad that does not meet minimum specification. Proceed to step 2.
- 2 Extend the boom until the wear pads are accessible.
- 3 Loosen the wear pad mounting fasteners.
- 4 Install the new shims under the wear pad to obtain zero clearance and zero drag.
- 5 Tighten the mounting fasteners.
- 6 Extend and retract the boom through an entire cycle. Check for tight spots that could cause binding or scraping.

NOTICE Always maintain squareness between the outer and inner boom tubes.

REV C

BOOM COMPONENTS

Wear Pad Specifications

Primary boom wear pad specifications	Minimum
Top, bottom and side wear pads (platform end of boom)	$\frac{5}{8}$ inch 15.9 mm
Side and bottom wear pads (pivot end of boom)	$\frac{1}{2}$ inch 12.7 mm
Top wear pads (pivot end of boom)	$\frac{5}{8}$ inch 15.9 mm
Secondary boom wear pad specifications	Minimum
Top, and side wear pads (extension end of boom)	$\frac{5}{8}$ inch 15.9 mm
Bottom wear pads (extension end of boom)	$\frac{1}{2}$ inch 12.7 mm
Top wear pads (pivot end of boom)	$\frac{1}{2}$ inch 12.7 mm
Bottom and side wear pads (pivot end of boom)	$\frac{7}{8}$ inch 22.2 mm

How to Remove the Primary Boom

⚠ WARNING

Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE

Perform this procedure with the boom in the stowed position.

NOTICE

When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the jib boom.
See 3-1, *How to Remove the Jib Boom*.
- 2 Remove the fasteners securing the limit switch to the primary boom at the pivot end of the boom. Do not disconnect the wiring. Move the limit switch to a safe location.
- 3 Tag and disconnect the wire harness from the primary boom angle sensor (PBAS).

NOTICE

The primary boom angle sensor is located inside the primary boom at the pivot end.

BOOM COMPONENTS

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- 4 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 5 Attach a lifting strap from an overhead crane to the barrel end of the primary boom lift cylinder.
- 6 Remove the pin retaining fasteners from the primary boom lift cylinder barrel-end pivot pin.
- 7 Place blocks under both ends of the primary boom lift cylinder for support.
- 8 Use a soft metal drift to remove the barrel-end pivot pin. Rest the barrel end of the primary boom cylinder on the blocks.

⚠ WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed

- 9 Attach a lifting strap from an overhead crane to the upper primary boom lift cylinder linkage arm. Support the arm.
- 10 Remove the pin retaining fasteners from the upper primary boom lift cylinder linkage arm where it connects to the primary boom.

- 11 Use a soft metal drift to remove the upper primary boom lift cylinder linkage arm pivot pin.

⚠ CAUTION Crushing hazard. The upper primary boom lift cylinder linkage arm will fall if not properly supported when the pivot pin is removed.

- 12 Attach a 5 ton / 5000 kg overhead crane to the center point of the primary boom.
- 13 Remove the pin retaining fastener from the primary boom pivot pin.
- 14 Use a soft metal drift to remove the primary boom pivot pin.

⚠ WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed

- 15 Carefully remove the primary boom from the machine and place it on a structure capable of supporting it.

⚠ WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when removed from the machine.

NOTICE When the primary boom is installed, the primary boom angle sensor will need to be calibrated.

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BOOM COMPONENTS

How to Disassemble the Primary Boom

NOTICE Complete disassembly of the primary boom is only necessary if the outer or inner primary boom tube must be replaced. The extension cylinder can be removed without completely disassembling the boom. See 4-4, *How to Remove the Primary Boom Extension Cylinder*.

- 1 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.
- 2 Place blocks under the barrel end of the primary boom extension cylinder for support.
- 3 Remove the pin retaining fastener from the extension cylinder barrel-end pivot pin at the pivot end of the primary boom.
- 4 Use a soft metal drift to remove the pin.

WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

- 5 Remove and label the location of the wear pads from the platform end of the primary boom.

NOTICE Pay careful attention to the location and number of shims used with each wear pad.

- 6 Attach a lifting strap from an overhead crane to the extension boom assembly.

- 7 Support and slide the extension boom assembly out of the primary boom tube and place it on a structure capable of supporting it.

WARNING Crushing hazard. The extension boom tube could become unbalanced and fall if not properly supported when removed from the primary boom tube.

NOTICE During removal, the overhead crane strap will need to be adjusted for proper balancing.

- 8 Remove the external snap rings from the extension cylinder rod-end pivot pin at the platform end of the extension tube.

WARNING Crushing hazard. The extension cylinder could become unbalanced and fall if not properly supported when removed from primary boom extension tube.

- 9 Use a soft metal drift to remove the pin.

WARNING Crushing hazard. The extension cylinder could become unbalanced and fall if not properly supported when removed from primary boom extension tube.

- 10 Attach a lifting strap from an overhead crane to the extension cylinder.

BOOM COMPONENTS

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- 11 Working at the end of the extension boom tube opposite the jib boom mount, support and slide the extension cylinder out of the extension boom tube.

WARNING Crushing hazard. The extension cylinder could become unbalanced and fall if not properly supported when removed from primary boom extension tube.

NOTICE During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

4-3 Primary Boom Lift Cylinder

The primary boom lift cylinder raises and lowers the primary boom. The primary boom lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Lift Cylinder

WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the primary boom to a horizontal position.
- 2 Raise the secondary boom until the primary boom lift cylinder rod-end pivot pin is above the counterweight.
- 3 Attach a 5 ton / 5000 kg overhead crane to the platform end of the primary boom. Support the boom. Do not apply any lifting pressure.

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BOOM COMPONENTS

- 4 Support both ends of the primary boom lift cylinder with a second overhead crane or similar lifting device.
- 5 Place blocks under the primary boom lift cylinder linkage arms for support.
- 6 Tag, disconnect and plug the primary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 7 Remove the pin retaining fastener from the primary boom lift cylinder rod-end pivot pin.
- 8 Use a soft metal drift to remove the pin.

⚠ DANGER Crushing hazard. The primary boom will fall if not properly supported when the pivot pin is removed.

⚠ DANGER Crushing hazard. The lift cylinder will fall if not properly supported when the pivot pin is removed.

⚠ CAUTION Crushing hazard. The primary boom lift cylinder linkage arms may fall if not properly supported when the pivot pin is removed.

- 9 Remove the primary boom lift cylinder barrel-end pivot pin retaining fasteners.

- 10 Use a soft metal drift to remove the barrel-end pivot pin. Remove the primary boom lift cylinder from the machine.

⚠ DANGER Crushing hazard. The lift cylinder will become unbalanced and fall if not properly supported when the pin is removed.

BOOM COMPONENTS

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4-4**Primary Boom Extension Cylinder**

The primary boom extension cylinder extends and retracts the primary boom extension tube. The primary boom extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Extension Cylinder

WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the primary boom to a horizontal position.
- 2 Extend the primary boom until the primary boom extension cylinder rod-end pivot pin is accessible.

- 3 Remove the access cover from the pivot end of the primary boom.
- 4 Place blocks under the barrel end of the primary boom extension cylinder for support.
- 5 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 6 Working at the platform end of the boom, remove the external snap rings from the extension cylinder rod-end pivot pin.
- 7 Use a soft metal drift to remove the pin.

WARNING Crushing hazard. The primary boom could fall when removed from the extension boom if not properly supported.

- 8 Remove the barrel-end pivot pin retaining fasteners.
- 9 Place a rod through the barrel-end pivot pin and twist to remove the pin.

REV C

BOOM COMPONENTS

10 Working at the pivot end of the boom, support and slide the extension cylinder out of the boom extension.

WARNING Crushing hazard. The extension cylinder could fall when removed from the extension boom if not properly supported.

CAUTION Component damage hazard. Be careful not to damage the primary boom angle sensor (PBAS) when removing the cylinder from the primary boom.

CAUTION Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

NOTICE Note the length of the cylinder after removal. For ease of installation, the cylinder must be at the same length for reinstallation.

4-5 Primary Boom Angle Sensor

A properly functioning primary boom angle sensor (PBAS) is essential to safe machine operation. The primary boom angle sensor is used to limit the angle of the primary boom relative to the angle of the secondary boom and gravity. The ECM at the ground controls (TCON) monitors the position and angle of the primary boom using the signal from PBAS. The PBAS signal is used to control the ramping of the primary boom as well as velocity control, limiting the speed of the primary boom to 1.3 feet / 0.4 meters per second.

How to Replace the Primary Boom Angle Sensor

NOTICE Perform this procedure on a firm, level surface with the boom in the stowed position.

- 1 Remove the retaining fasteners from the boom end cover at the pivot end of the primary boom. Remove the cover from the machine.
- 2 Locate the primary boom angle sensor inside the primary boom at the boom pivot pin.
- 3 Tag and disconnect the electrical connector from the sensor.
- 4 Remove the angle sensor mounting bracket retaining fasteners.
- 5 Remove the wing nut from the threaded rod. Do not disconnect the threaded rod from clevis yoke.

BOOM COMPONENTS

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- 6 Remove the angle sensor and bracket assembly.
- 7 Remove the sensor retaining fasteners from the sensor bracket. Remove the angle sensor.
- 8 Install the new angle sensor onto the mounting bracket.
- 9 Install the angle sensor and bracket assembly.

NOTICE The sensor should be installed rotated in a fully counter clock-wise position.

- 10 Insert the threaded rod through the threaded rod adjustment bracket.
- 11 Move threaded rod to the top of the slotted hole. Tighten the wing nut and hex nut towards each other.
- 12 Connect the electrical connector to the angle sensor.
- 13 Calibrate the primary boom angle sensor. See *How to Calibrate the Primary Boom Angle Sensor*.

⚠ DANGER Tip-over hazard. Failure to calibrate the primary boom sensor could cause the machine to tip over resulting in death or serious injury.

How to Calibrate the Primary Boom Angle Sensor

NOTICE Perform this procedure on a firm, level surface with the boom in the stowed position.

NOTICE A digital level will be required to perform this procedure.

- 1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.
 - 2 Press and hold the enter button  until the engine symbol appears the display at the ground control box.
 - 3 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence:    .
 - 4 Press the scroll button  until PRIMARY BOOM ANGLE = 70° is shown on the display.
 - 5 Press the plus button  to select yes, then press and hold the enter button  to accept.
 - 6 Press the scroll button  until EXIT is shown on the display. Press the plus button  to select yes, then press and hold the enter button  to accept.
- ⦿ Result: The alarm should sound.
- ✗ Result: The alarm does not sound. Repeat this procedure beginning with step 1.

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BOOM COMPONENTS

- 7 Loosen the Primary Boom Angle Sensor (PBAS) assembly bracket fasteners attached to the primary boom. Loosen the wing nut and hex nut on the threaded rod to allow the threaded rod to move upward. Tighten the fasteners.
- 8 Set a digital level on top of the mast so it is viewable from the ground controls.
- 9 Start the engine.
- 10 Raise the boom until the digital level displays 70°.
- 11 Loosen the wing nut from threaded rod and move the threaded rod down until the engine turns off.
- 12 Screw threaded rod into clevis yoke. Tighten the wing nut to welded bracket. Tighten the jam nut to welded bracket. Tighten the PBAS fasteners to boom.
- ⦿ Result: The ground control box display should read P9B & P11 FAULT.
- 13 Push in the red Emergency Stop button to the off position. Wait until display turns off before proceeding.
- 14 Press and hold the enter button  and pull out the red Emergency Stop button to the on position.
- 15 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.
- 16 Press and hold the enter button  until the engine symbol appears the display at the ground control box.
- 17 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence:    .
- 18 Press the scroll button  until PRIMARY BOOM ANGLE = 70° is shown on the display.
- 19 Press the plus button  to select yes, then press and hold the enter button  to accept.
- 20 Press the scroll button  until EXIT is shown on the display. Press the plus button  to select yes, then press and hold the enter button  to accept.
- 21 At the ground controls, use auxiliary power and lower the boom until the faults are no longer shown on the display.
- ⦿ Result: The flashing arrow in the display at the ground controls will turn off.
- ✗ Result: The flashing arrow in the display at the ground controls does not turn off. Repeat this procedure beginning with step 1.
- 22 Start the engine and activate the primary boom down function. Release the function enable button when the digital level displays 40°. Push in the red Emergency Stop button to the off position.
- 23 Press and hold the enter button  and pull out the red Emergency Stop button to the on position.

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- 24 Press and hold the enter button  until the engine symbol appears in the display at the ground controls.
- 25 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence:    .
- 26 Press the scroll button  until PRIMARY BOOM ANGLE = 40° is shown on the display.
- 27 Press the plus button  to select yes, then press and hold the enter button  to accept.
- ⦿ Result: The alarm should not sound.
 - ✗ Result: The alarm does sound. Repeat this procedure beginning with step 1.
- 28 Press the scroll button until EXIT is shown on the display. Press the plus button  to select yes, then press and hold the enter button  to accept.
- 29 Start the engine.
- 30 Activate the boom up function until the digital level reads 65°.
- ⦿ Result: The primary boom should stop.
 - ✗ Result: The primary boom does not stop. Immediately release the function enable button and lower the boom. Repeat this procedure beginning with step 1.

⚠ DANGER Tip-over hazard. If the boom does not stop at 65°, immediately release the function enable button and lower the primary boom. Failure to lower the boom could cause the machine to tip over resulting in death or serious injury.

4-6**Secondary Boom****How to Remove the Secondary Boom**

⚠ WARNING Bodily injury hazard. The procedures in this section require specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

- 1 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.

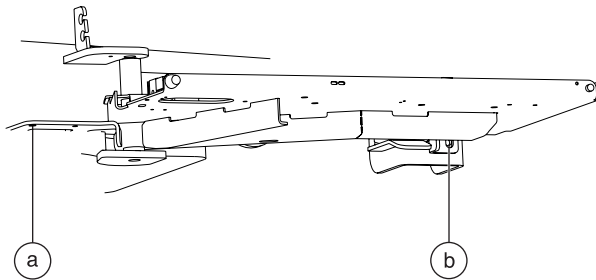
REV C

BOOM COMPONENTS

- 2 Tag, disconnect and plug the hydraulic hoses at the primary boom lift cylinder. Cap the fittings on the cylinder.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



- a engine tray anchor hole
b engine tray retaining fastener

- 4 Locate the engine tray anchor hole at the pivot end of the engine tray.

- 5 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠ WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

- 6 Attach a lifting strap from an overhead crane to the lug on the barrel end of the primary boom lift cylinder. Raise the primary boom lift cylinder to a vertical position.
- 7 Remove the pin retaining fastener from the primary boom rod end pivot pin.
- 8 Use a slide hammer to remove the pin. Remove the primary boom lift cylinder and linkage arms from the machine.

⚠ WARNING Crushing hazard. The primary boom lift cylinder and linkage arms could become unbalanced and fall if not properly supported when the pin is removed.

BOOM COMPONENTS

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4-7

Secondary Boom Lift Cylinder**How to Remove the Secondary Boom Lift Cylinder**

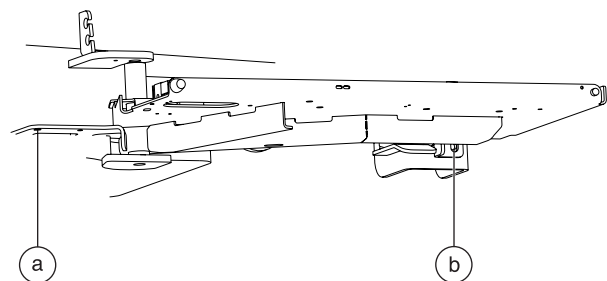
⚠ WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Lower the secondary boom to the stowed position.
- 2 Tag, disconnect, secure and remove the wire harnesses connecting the batteries. Remove battery fasteners and hooks from battery tray. Remove the batteries and store them in a safe and secure location away from the unit.

⚠ WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 3 Remove the retaining fasteners securing the upper and lower turntable covers from the turntable at the platform end. Remove the covers.
- 4 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



a engine tray anchor hole
b engine tray retaining fastener

- 5 Locate the engine tray anchor hole at the pivot end of the engine tray.
- 6 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠ WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

- 7 Remove the fuel tank filler cap.

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BOOM COMPONENTS

- 8 Using an approved hand-operated pump, drain the fuel tank into a suitable container. *Refer to Section 2, Specifications.*

⚠ DANGER Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

⚠ DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

NOTICE Be sure to only use a hand-operated pump suitable for use with gasoline and diesel fuels.

- 9 Tag and disconnect the wire harness from the fuel level sending unit.
- 10 Tag, disconnect and plug the fuel hoses from the fuel tank.
- 11 Clean up any fuel that may have spilled.
- 12 Remove the fuel tank mounting fasteners. Carefully remove the fuel tank from the machine.

CAUTION Component damage hazard. The fuel tank is plastic and may become damaged if allowed to fall.

NOTICE Clean the fuel tank and inspect for cracks and other damage before installing it onto the machine.

- 13 Tag, disconnect and plug the hydraulic hoses from the secondary boom lift cylinder.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 14 Place blocks under each end of the secondary boom lift cylinder for support.
- 15 Remove the pin retaining fasteners from the secondary boom lift cylinder rod-end pivot pin.
- 16 Use a soft metal drift to remove the pin.

⚠ WARNING Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

- 17 Remove the pin retaining fastener from the secondary boom lift cylinder barrel-end pivot pin.

- 18 Use a soft metal drift to remove the pin.

⚠ WARNING Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

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- 19 Remove the secondary boom lift cylinder from the machine by pulling it through the platform end of the secondary boom.

⚠ WARNING Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

CAUTION Component damage hazard. When removing the secondary boom lift cylinder from the machine, be careful not to damage the counterbalance valves at the barrel end of the cylinder.

CAUTION Component damage hazard. Cables and hoses can be damaged if the cylinder is pulled across them.

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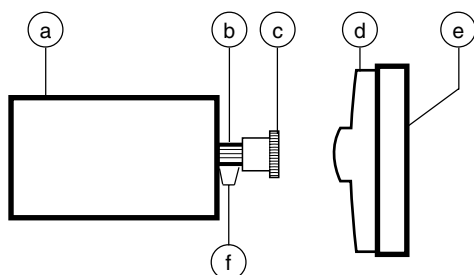
Engines

5-1 RPM Adjustment

Refer to Maintenance Procedure B-20, *Check and Adjust the Engine RPM*.

5-2 Flex Plate

The flex plate acts as a coupler between the engine and the pump. It is bolted to the engine flywheel and has a splined center to drive the pump.



- a pump
- b pump shaft
- c pump coupler
- d flex plate with raised spline
- e engine flywheel
- f 0.185 inch / 4.7 mm gap - Deutz Engines
0.15 inch / 3.8 mm gap - GM Engines
0.25 inch / 6.35 mm gap - Ford Engine
0.25 inch / 6.35 mm gap - Perkins 804C-33 Engine
0.3 inch / 7.6 mm gap - Perkins 704-30 Engine

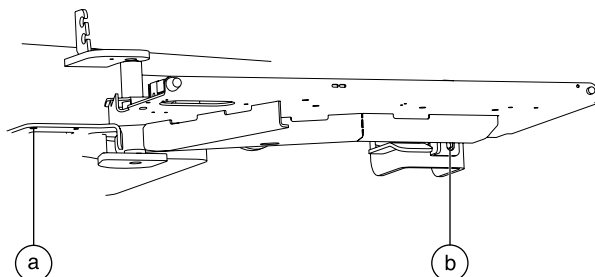
How to Remove the Flex Plate

NOTICE Perform this procedure with the engine off and cool to the touch.

- 1 Open the engine side turntable cover.
- 2 Tag and disconnect the battery cables from the batteries.

WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 3 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



- a engine tray anchor hole
- b engine tray retaining fastener

- 4 Tag and disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.

ENGINES

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GM models:

- 5 Remove the fasteners securing the muffler to the exhaust manifold.

CAUTION Burn hazard. Hot engine parts can cause severe burns.

- 6 Remove muffler mounting bracket fasteners. Remove the muffler and bracket assembly from the engine.
- 7 Remove the hose clamp securing the air filter assembly to the air inlet tube.
- 8 Remove the air cleaner bracket fasteners. Remove the air cleaner and bracket assembly from the engine.
- 9 Support the drive pump with an appropriate lifting device. Do not apply any lifting pressure.
- 10 Remove all of the remaining bell housing to engine fasteners. Carefully pull the pump away from the engine and secure it from moving.

CAUTION Component damage hazard. Hoses can be damaged if they are kinked or pinched

- 11 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Ford models:

- 5 Tag and disconnect the wire harness from the oxygen sensor.
- 6 Remove the exhaust pipe heat shield fasteners from the top of the muffler.

CAUTION Burn Hazard. Hot engine parts can cause severe burns.

- 7 Remove the muffler retainer bracket fasteners.
- 8 Remove the muffler fasteners securing the muffler to the exhaust manifold. Remove the muffler from the bracket.
- 9 Remove the muffler bracket retaining fasteners. Remove the muffler bracket from the engine.
- 10 Close the shutoff valve on the Liquid Petroleum Gas (LPG) tank by turning it clockwise (if equipped).
- 11 Tag and disconnect the wiring from the LPG solenoid.
- 12 Remove the engine starter retaining fasteners and remove the starter from the engine. Do not disconnect the wiring.
- 13 Remove the dipstick tube bracket fasteners.
- 14 Attach a lifting strap from an overhead crane to the lifting eyes on the engine.
- 15 Remove the bell housing engine tray fasteners.
- 16 Raise the engine slightly using the overhead crane. Do not apply any lifting pressure.
- 17 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing engine fasteners.
- 18 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

CAUTION Component damage hazard. Hoses can be damaged if they are kinked or pinched

- 19 Remove the flex plate mounting fasteners. Remove the flex plate from the engine fly wheel.

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ENGINES

Deutz F4L-913 models:

- 5 Tag and disconnect the wiring from the bell housing.
- 6 Remove the exhaust tailpipe and air inlet tube U-bolts from the air cleaner mounting bracket.

CAUTION Burn hazard. Hot engine parts can cause severe burns.

- 7 Remove the fuel filter/water separator retaining fasteners. Remove the filter/separator from the engine. Do not disconnect the fuel hoses.
- 8 Remove the air cleaner mounting bracket fasteners. Remove the air cleaner and bracket assembly from the engine.
- 9 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing to engine fasteners.
- 10 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

CAUTION Component damage hazard.
Hoses can be damaged if they are kinked or pinched

- 11 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Deutz BF4L-2011 models:

- 5 Tag and disconnect the wiring from the bell housing.
- 6 Remove the U-bolt from the exhaust flex pipe at the muffler.

CAUTION Burn hazard. Hot engine parts can cause severe burns.

- 7 Remove the muffler bracket retaining fasteners from bell housing. Remove the muffler and bracket assembly from the engine.
- 8 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing engine fasteners.
- 9 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

CAUTION Component damage hazard.
Hoses can be damaged if they are kinked or pinched

- 10 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

ENGINES

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Perkins 704-30 Models:

- 5 Remove the clamp securing the air intake elbow to the air cleaner assembly. Remove the air intake tube from the engine. Do not remove the elbow from the air intake tube.
- 6 Support the drive pump with an appropriate lifting device. Remove all of the bell housing to engine fasteners.
- 7 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

CAUTION Component damage hazard.
Hoses can be damaged if they are kinked or pinched

- 8 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Perkins 804C-33 Models:

- 5 Tag and disconnect the wiring from the bell housing.
- 6 Remove the exhaust pipe clamp at the muffler.

CAUTION Burn hazard. Hot engine parts can cause severe burns.

- 7 Remove the muffler mounting bracket fasteners. Remove the muffler and bracket assembly from the engine.
- 8 Remove the hose clamps from the air cleaner elbow and the engine intake manifold.
- 9 Remove the air cleaner mounting bracket fasteners. Remove the air cleaner and bracket assembly from the engine.
- 10 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing to engine fasteners.
- 11 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

CAUTION Component damage hazard.
Hoses can be damaged if they are kinked or pinched

- 12 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

REV B

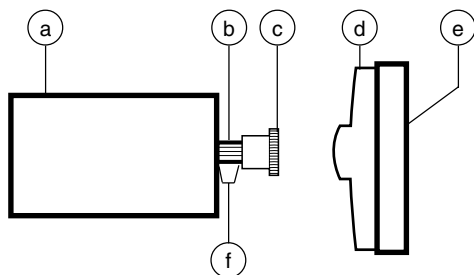
ENGINES

How to Install the Flex Plate

- 1 Install the flex plate onto the engine flywheel with the raised spline towards the pump.
- 2 **Ford models:** Torque the flex plate mounting bolts in sequence to 14 ft-lbs / 19 Nm. Then torque the flex plate mounting bolts in sequence to 20 ft-lbs / 27 Nm.
GM models: Torque the flex plate mounting bolts in sequence to 22 ft-lbs / 30 Nm. Then torque the flex plate mounting bolts in sequence to 31 ft-lbs / 42 Nm.
Deutz models: Torque the flex plate mounting bolts in sequence to 26 ft-lbs / 35 Nm. Then torque the flex plate mounting bolts in sequence to 37 ft-lbs / 51 Nm.
Perkins models: Torque the flex plate mounting bolts in sequence to 13 ft-lbs / 18 Nm. Then torque the flex plate mounting bolts in sequence to 19 ft-lbs / 26 Nm.

- 3 Install the pump coupler onto the pump shaft with the set screw toward the pump. Leave the appropriate gap between coupler and pump end plate for your engine.
- 4 Apply Loctite® removable thread sealant to the pump coupler set screw. Torque set screw to 61 ft-lbs / 83 Nm.
- 5 Install the pump onto the bell housing/mounting plate and torque the pump retaining fasteners to specification. Refer to Section 2, *Specifications* for torque specifications.

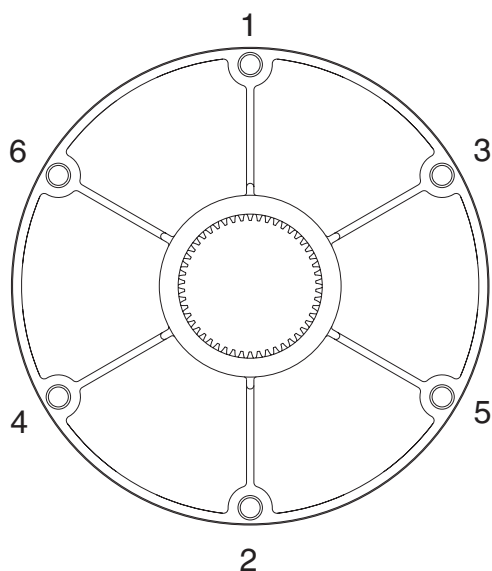
CAUTION Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



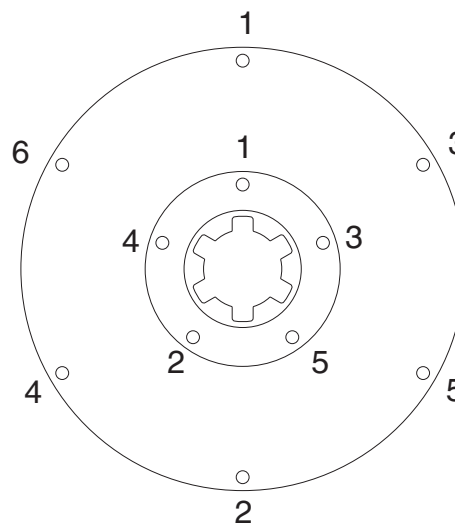
- a pump
- b pump shaft
- c pump coupler
- d flex plate with raised spline
- e engine flywheel
- f 0.185 inch / 4.7 mm gap - Deutz Engines
 0.15 inch / 3.8 mm gap - GM Engines
 0.25 inch / 6.35 mm gap - Ford Engine
 0.25 inch / 6.35 mm gap - Perkins 804C-33 Engine
 0.3 inch / 7.6 mm gap - Perkins 704-30 Engine

ENGINES

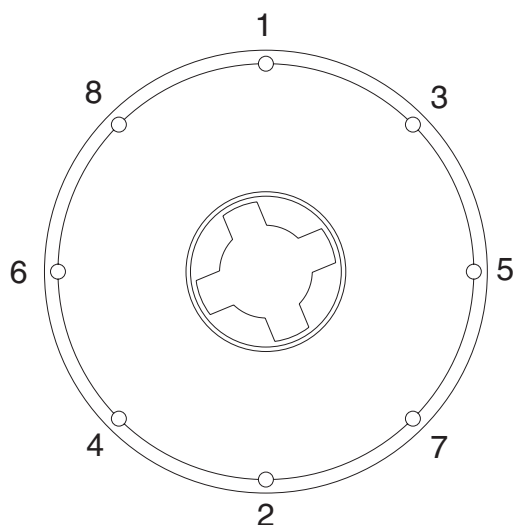
REV B



Ford, Perkins and
Deutz BF4L-2011 models



GM models



Deutz F4L-913 models

- 6 Install the pump coupler onto the pump shaft with the set screw toward the pump. Leave the appropriate gap between coupler and pump end plate for your engine.
- 7 Install the pump and bellhousing assembly onto the engine. Torque the bellhousing mounting bolts in sequence to 28 ft-lbs / 38 Nm. Refer to the illustrations on the next page.

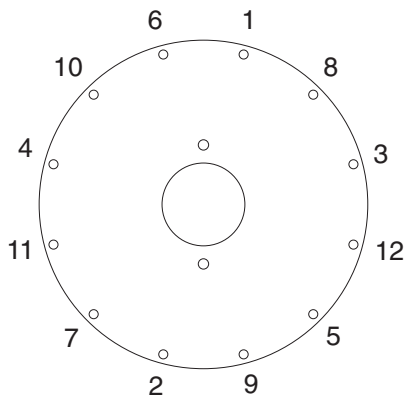
CAUTION Component damage hazard. When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

CAUTION Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.

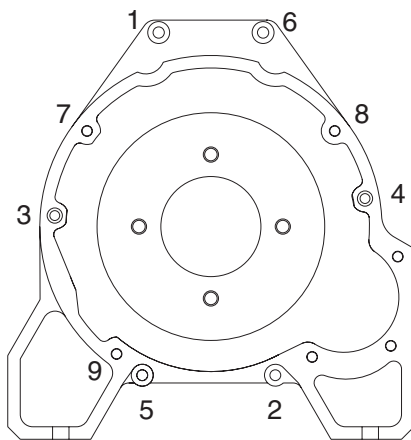
REV B

ENGINES

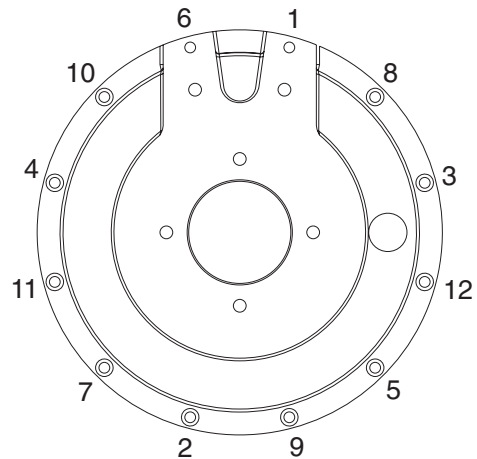
- 8 Torque the bellhousing mounting bolts in sequence to 40 ft-lbs / 54 Nm.



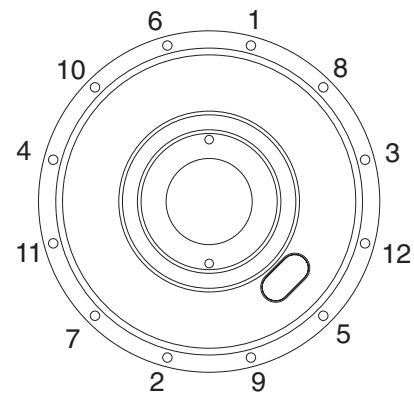
Deutz F4L-913 and
Perkins 704-30 models



Ford models



Deutz BF4L-2011 models



Perkins 804C-33 and
GM models

ENGINES

REV B

5-3**Engine Fault Codes -
Gasoline/LPG Models****How to Retrieve Engine Fault
Codes**

When an engine malfunction is detected by the Electronic Control Module (ECM), a fault code is recorded and the check engine light will turn on at the platform controls. Use the following procedure to retrieve the engine fault code to determine the engine malfunction.

NOTICE Perform this procedure with the key switch in the off position

- 1 Open the engine side turntable cover.
 - 2 Locate the run/test toggle switch located on the relay box cover.
 - 3 Pull out the red Emergency Stop button to the on position at the ground controls.
 - 4 Hold the run/test toggle switch to the test position and turn the key switch to the ground controls position.
- ⦿ Result: The check engine light should turn on. The check engine light should begin to blink.

NOTICE The check engine light will blink a "123" code three times before blinking a fault code if one is present.

- 5 Continue to hold the run/test toggle switch in the test position and count the blinks.

NOTICE If any fault codes are present, the ECM will blink a three digit code. It will blink the first digit of a three digit code, pause, blink the second digit, pause, and then blink the third digit. For example: the check engine light blinks 5 consecutive times, blinks 3 times and then 1 time. That would indicate code 531.

NOTICE Before the fault codes are displayed, the check engine light will blink a code 123 times. After the fault codes, the check engine light will blink a code 123 three times again indicating the end of the stored codes.

- 6 Refer to Section 5, *Fault Codes* for definition of engine fault codes.

**How to Clear Engine Fault Codes
from the ECM**

NOTICE Perform this procedure with the engine off and the key switch in the off position.

- 1 Open the engine side turntable cover and locate the battery.
- 2 Disconnect the negative battery cable from the battery for a minimum of 5 minutes.

⚠ WARNING Electrocutation hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 3 Connect the negative battery cable to the battery.

REV A

Ground Controls

6-1 Circuit Boards

The ground control box (TCON) is the communication and operations center for the machine. The ground control box contains two key switches. The key switch towards the top of the control box is for selection of ground or platform controls. The key switch at the bottom of the control box is the Service Bypass key switch. It is used to correct an out-of-level platform. If the machine trips an envelope safety switch, the operator at the ground controls can turn and hold the Service Bypass key switch in the **RECOVER** position, which will automatically retract the boom and lower the platform to the ground.

The ground control box contains a replaceable membrane decal with touch sensitive buttons for various machine functions. The ground control box also contains two printed circuit boards:

The **LCD (Liquid Crystal Display) circuit board** is mounted to the inside of the control box lid which controls the LCD display screen.

The **ECM circuit board** is the main circuit board for the machine. There are relays on the ECM circuit board that can be replaced. All operating parameters and configuration of options for the machine are stored in the ECM memory.

NOTICE

The ECM circuit board inside the ground control box (TCON) cannot be replaced by itself. If the ECM circuit board is faulty and needs to be replaced, contact the Genie Industries Service Department.

NOTICE

When an ECM circuit board is replaced, the proportional valves will need to be calibrated. See 1-3, *How to Calibrate a Joystick*.

How to Determine the Revision Level

- 1 Turn the key switch to ground controls and pull out the red Emergency Stop buttons to the on position at both platform and ground controls.
- ② Result: The revision level of the ECM will appear in the LED display window.

How to Remove the LCD Display Screen Circuit Board

- 1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.
- 2 Remove the ground control box lid fasteners. Open the control box lid.

⚠ WARNING

Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

CAUTION

Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

- 3 Carefully disconnect the ribbon cable from the LCD display circuit board.
- 4 Remove the LCD display circuit board retaining fasteners.
- 5 Carefully remove the LCD display circuit board from the ground control box lid.

GROUND CONTROLS

REV A

6-2**Membrane Decal**

The membrane decal is a special decal that consists of a decal with an electronic membrane on the backside. The membrane contains touch sensitive areas that, when pushed, activates the machine functions. The membrane buttons activate machine functions similar to toggle switches, but do not have any moving parts.

How to Replace the Membrane Decal

- 1 Turn the key switch at to the off position.
- 2 Push in the red Emergency Stop button to the off position at both the ground and platform controls.
- 3 Remove the ground control box lid fasteners. Open the control box lid.
- 4 Tag and disconnect the two ribbon cables from the membrane decal at the ECM circuit board.

⚠ WARNING Electrocutation hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

- 5 Carefully remove the membrane decal from the control box lid while guiding the ribbon cables out of the control box lid.
- 6 Remove any decal adhesive from the control box lid with a mild solvent.

CAUTION Component damage hazard. Certain solvents can damage LCD display. Do not allow any solvent to come in contact with the LCD display screen.

- 7 Install the new membrane decal onto the control box lid while guiding the ribbon cables through the control box lid.
- 8 Connect the ribbon cables to the ECM circuit board.
- 9 Close the control box lid and install the retaining fasteners.

REV B

Hydraulic Pumps

7-1 Function Pump

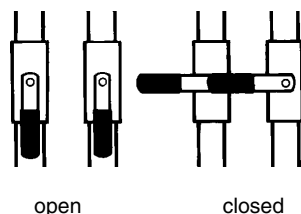
How to Remove the Function Pump

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 **Models without hydraulic tank shutoff valves:** Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.

Models with hydraulic tank shutoff valves:
Close the two hydraulic tank valves located at the hydraulic tank.

CAUTION Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



- 2 Tag, disconnect and plug the hydraulic hoses at the function pump. Cap the fittings on the pump.

WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Remove the pump mounting fasteners. Carefully remove the pump.

CAUTION Component damage hazard. Be sure to open the two hydraulic tank valves (if equipped) and prime the pump after installing the pump. See 7-2, *How to Prime the Pump*.

HYDRAULIC PUMPS

REV B

7-2 Drive Pump

The drive pump is a bi-directional variable displacement piston pump. The pump output is controlled by the electronic displacement controller (EDC), located on the pump. Any internal service to the pump should only be performed at an authorized Sauer-Danfoss service center. Contact the Genie Industries Service Department to locate your local authorized service center.

How to Remove the Drive Pump

CAUTION Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

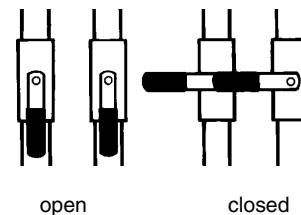
NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Disconnect the wire harness at the electronic displacement controller (EDC), located on the drive pump.

- 2 **Models without hydraulic tank shutoff valves:** Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.

Models with hydraulic tank shutoff valves: Close the two hydraulic tank valves located at the hydraulic tank.

CAUTION Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



- 3 Tag, disconnect and plug the hydraulic hoses at the drive and function pumps. Cap the fittings on the pumps.

WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

REV B

HYDRAULIC PUMPS

- 4 Support the pumps with a suitable lifting device and remove the two drive pump mounting fasteners.
- 5 Carefully pull the drive pump out until the pump coupler separates from the flex plate.
- 6 Remove the drive pump assembly from the machine.

CAUTION

Component damage hazard.
Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

NOTICE

Before installing the pump, verify proper pump coupler spacing. See 5-2, *Flex Plate*.

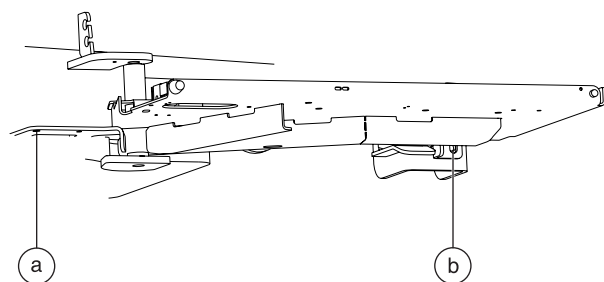
How to Prime the Pump

- 1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.
- 2 Remove the safety pin (if equipped) from the engine tray latch.

NOTICE

The engine tray latch is located under the engine tray at the counterweight end of the machine.

- 3 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



- a engine tray anchor hole
b engine tray retaining fastener

- 4 Locate the engine tray anchor hole at the pivot end of the engine tray.
- 5 Install the bolt removed in step 4 into the anchor hole to secure the engine tray from moving.

WARNING

Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

- 6 **Deutz and Perkins models:** Tag and disconnect the engine wiring harness from the fuel shutoff solenoid at the injector pump.

GM and Ford models: Close the valve on the LPG tank. Disconnect the hose from the tank. Move the fuel select switch to the LPG position.

- 7 Have another person crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi / 22 bar.
- 8 **Deutz and Perkins models:** Connect the engine wiring harness to the fuel solenoid.
GM and Ford models: Connect the LPG hose to the LPG tank and open the valve on the tank.
- 9 Start the engine from the ground controls and check for hydraulic leaks.

Manifolds

REV C

8-1

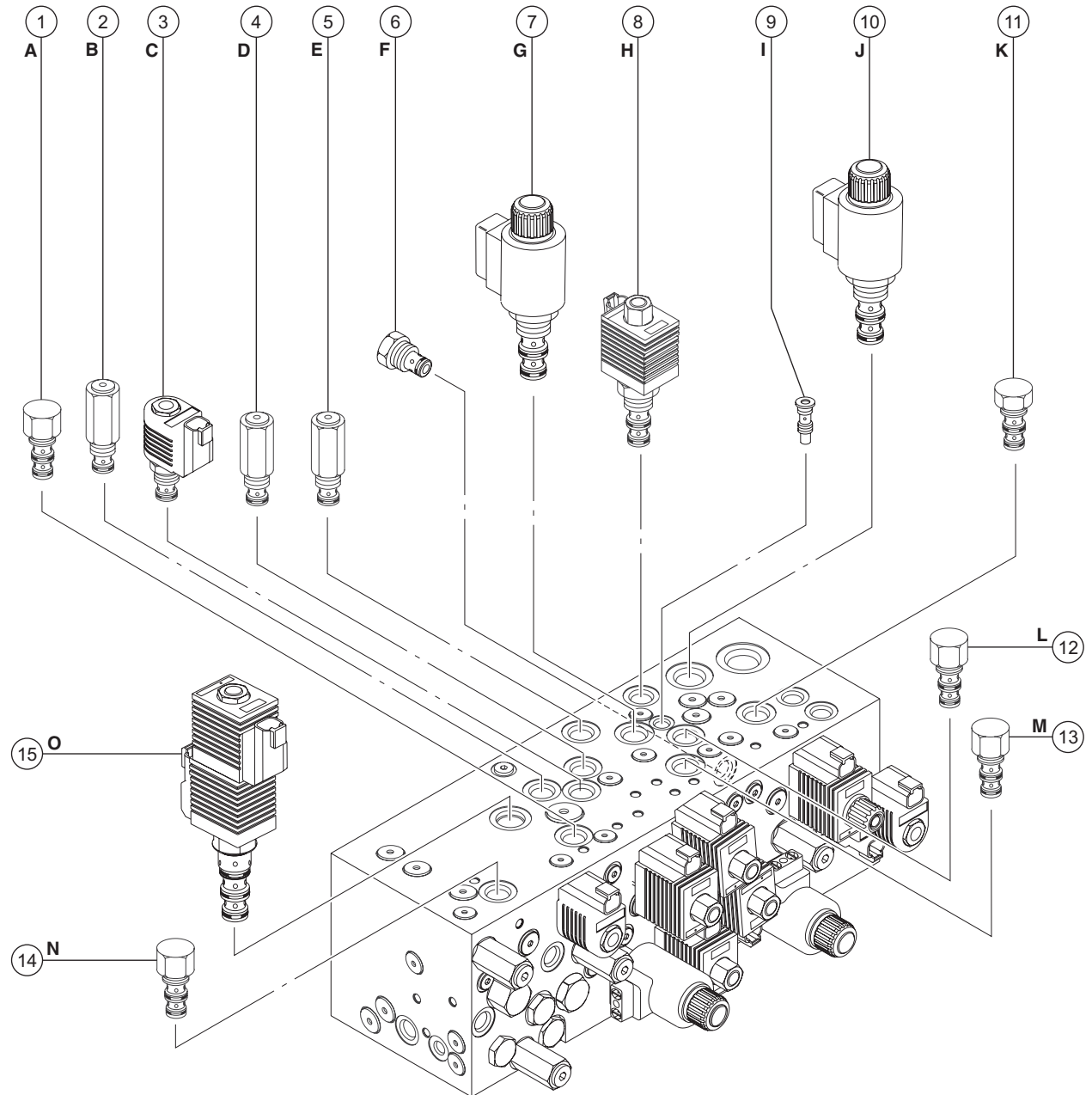
Function Manifold - View 1

The function manifold is located next to the ground control box.

Index No.	Description	Schematic Item	Function	Torque
1	Differential sensing valve	A	Secondary boom up/extend and down/retract	30-35 ft-lbs / 41-47 Nm
2	Relief valve, 2500 psi / 172 bar	B	Secondary boom up	20-25 ft-lbs / 27-34 Nm
3	Solenoid valve, 2 position 2 way	C	Secondary boom up circuit	20-25 ft-lbs / 27-34 Nm
4	Relief valve, 2500 psi / 172 bar	D	Secondary boom down	20-25 ft-lbs / 27-34 Nm
5	Relief valve, 1300 psi / 89.6 bar	E	Primary boom down	20-25 ft-lbs / 27-34 Nm
6	Flow regulator valve, 0.1 gpm / 0.38 L/min	F	Bleeds off check valves in differential sensing circuits to tank	20-25 ft-lbs / 27-34 Nm
7	Proportional solenoid valve	G	Primary boom up/down	30-35 ft-lbs / 41-47 Nm
8	Solenoid valve, 2 position 3 way	H	Primary boom retract	33-37 ft-lbs / 45-50 Nm
9	Check valve	I	Differential sensing circuit, primary boom extend/retract	8-10 ft-lbs / 11-14 Nm
10	Solenoid valve, 2 position 3 way	J	Primary boom extend	50-55 ft-lbs / 68-75 Nm
11	Differential sensing valve	K	Turntable rotate left/right	30-35 ft-lbs / 41-47 Nm
12	Differential sensing valve	L	Primary boom extend/retract	30-35 ft-lbs / 41-47 Nm
13	Differential sensing valve	M	Primary boom up/down	30-35 ft-lbs / 41-47 Nm
14	Priority flow regulator valve, 3 gpm / 11.4 L/min	N	Controls flow to the oscillate and platform manifolds	30-35 ft-lbs / 41-47 Nm
15	Solenoid valve, 3 position 4 way	O	Secondary boom extend/retract	33-37 ft-lbs / 45-50 Nm

REV C

MANIFOLDS



MANIFOLDS

REV C

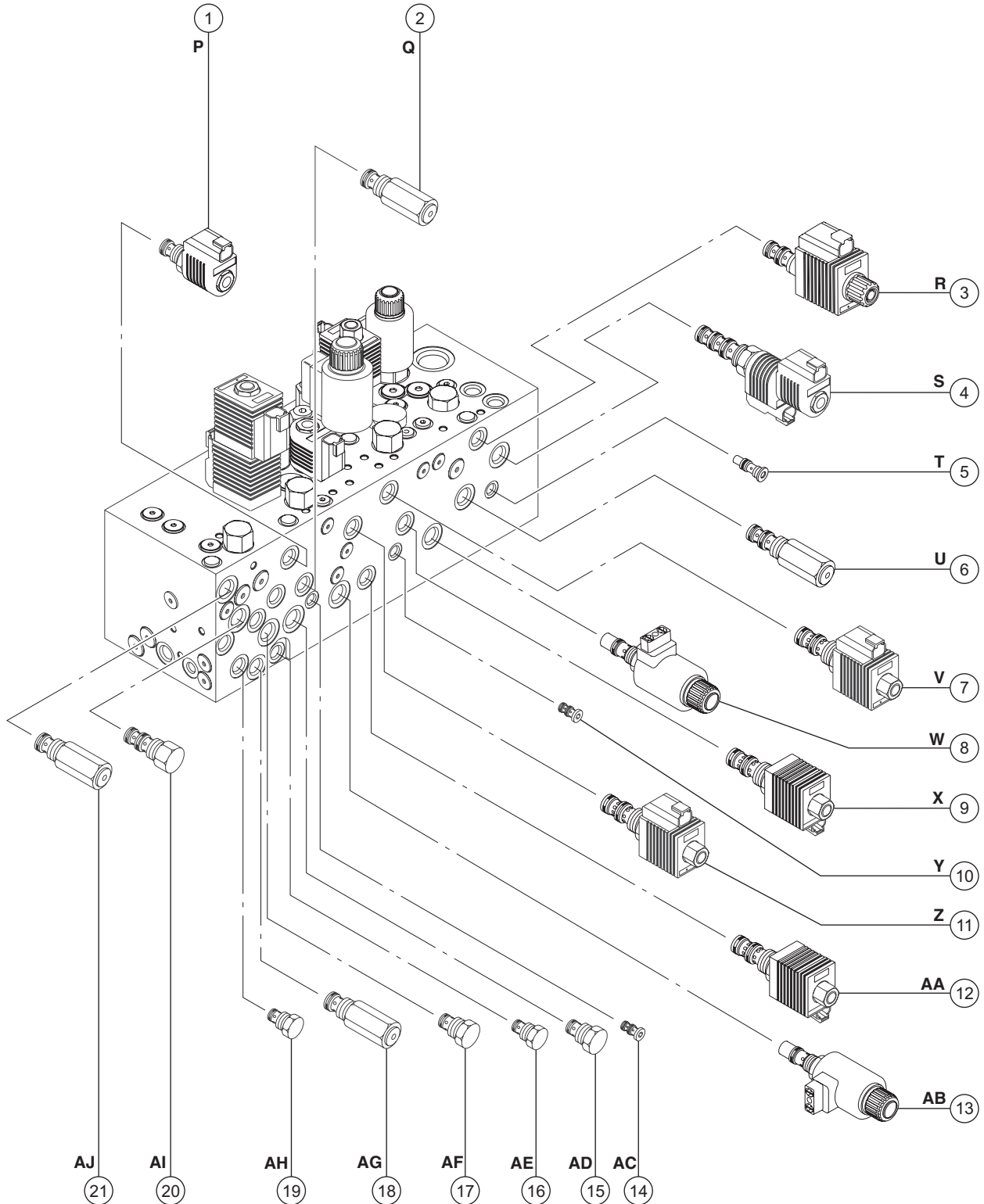
8-2

Function Manifold - View 2

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 2 way	P	Secondary boom extend circuit	20-25 ft-lbs / 27-34 Nm
2	Relief valve, 2600 psi / 179 bar	Q	Secondary boom extend	20-25 ft-lbs / 27-34 Nm
3	Proportional solenoid valve	R	Turntable rotate left/right	20-25 ft-lbs / 27-34 Nm
4	Solenoid valve, 3 position 4 way	S	Turntable rotate left/right	26-30 ft-lbs / 35-41 Nm
5	Check valve	T	Differential sensing circuit, turntable rotate	8-10 ft-lbs / 11-14 Nm
6	Relief valve, 1300 psi / 89.6 bar	U	Primary boom extend	30-35 ft-lbs / 41-47 Nm
7	Solenoid valve, 2 position 3 way	V	Primary boom up	33-37 ft-lbs / 45-50 Nm
8	Proportional solenoid valve	W	Primary boom extend/retract	30-35 ft-lbs / 41-47 Nm
9	Solenoid valve, 2 position 3 way	X	Primary boom down	33-37 ft-lbs / 45-50 Nm
10	Check valve	Y	Differential sensing circuit, primary boom up/down	8-10 ft-lbs / 11-14 Nm
11	Solenoid valve, 2 position 3 way	Z	Secondary boom up	33-37 ft-lbs / 45-50 Nm
12	Solenoid valve, 2 position 3 way	AA	Secondary boom down	33-37 ft-lbs / 45-50 Nm
13	Proportional solenoid valve	AB	Secondary boom extend/retract	30-35 ft-lbs / 41-47 Nm
14	Check valve	AC	Differential sensing circuit, secondary boom extend/retract	8-10 ft-lbs / 11-14 Nm
15	Check valve, 5 psi / 0.34 bar	AD	Blocks flow from auxiliary pump #1 to function pump #1	30-35 ft-lbs / 41-47 Nm
16	Check valve, 5 psi / 0.34 bar	AE	Blocks flow from function pump #1 to auxiliary pump #1	20-25 ft-lbs / 27-34 Nm
17	Check valve, 5 psi / 0.34 bar	AF	Blocks flow from auxiliary pump #2 to function pump #2	20-25 ft-lbs / 27-34 Nm
18	Relief valve, 3000 psi / 207 bar	AG	Oscillate and platform manifold system relief	20-25 ft-lbs / 27-34 Nm
19	Check valve, 5 psi / 0.34 bar	AH	Blocks flow from function pump #2 to auxiliary pump #2	20-25 ft-lbs / 27-34 Nm
20	Differential sensing valve, 150 psi / 10.3 bar	AI	Meters flow to functions	30-35 ft-lbs / 41-47 Nm
21	Relief valve, 3200 psi / 220.6 bar	AJ	Boom functions system relief	30-35 ft-lbs / 41-47 Nm

REV C

MANIFOLDS



MANIFOLDS

REV C

8-3 Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

- 1 Locate the boom retracted limit switch (LSP1RO) limit switch on the outside of the primary boom at the pivot end of the primary boom.
- 2 Tag and disconnect the wire harness from the limit switch, and install a wire jumper between pins 1 and 2 of the limit switch connector. Place another wire jumper between pins 3 and 4 of the limit switch connector.
- 3 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the PTEST port on the function manifold.
- 4 Start the engine from the ground controls.
- 5 Press and release the rpm select button until the engine changes to high idle.
- 6 Simultaneously push and hold the function enable/high speed button and the primary boom retract button with the primary boom fully retracted. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AJ).
- 8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 9 Repeat steps 4 through 8 confirm the relief valve pressure.
- 10 Remove the pressure gauge.
- 11 Remove the wire jumpers from the limit switch connector.
- 12 Securely install the LSP1RO pig tail into the wire harness.

How to Adjust the Primary Boom Down Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.
- 2 Start the engine from the ground controls.
- 3 Press and release the rpm select button until the engine changes to high idle.
- 4 Raise the primary boom approximately 5 feet / 1.5 m.

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- 5 Place a 4 x 4 inch / 10 x 10 cm block on the primary boom rest pad. Lower the primary boom onto the block.

WARNING Crushing hazard. Keep hands clear of the block when lowering the primary boom.

- 6 Simultaneously push and hold the function enable/high speed button and the primary boom down button. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item E).
- 8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 9 Start the engine and repeat steps 6 through 8 to confirm the relief valve pressure.
- 10 Start the engine and raise the primary boom approximately 12 inches / 30 cm. Remove the block and lower the primary boom to the stowed position.
- 11 Turn the engine off and remove the pressure gauge.

How to Adjust the Primary Boom Extend Relief Valve

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.
- 2 Start the engine from the ground controls.
- 3 Raise the boom to a horizontal position. Turn the engine off.
- 4 Locate the boom extended limit switch (LSP1EO) on the outside of the primary boom.
- 5 Remove the limit switch mounting bracket retaining fasteners.
- 6 Pull the limit switch and bracket assembly out of the boom tube and let it hang down.
- 7 Start the engine from the ground controls and press and release the rpm select button until the engine changes to high idle.
- 8 Simultaneously push and hold the function enable/high speed button and the primary boom extend button with the primary boom fully extended. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 9 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item U).

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- 10 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠ WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 11 Repeat steps 7 through 8 to confirm relief valve pressure.
- 12 Start the engine and fully retract the primary boom. Turn the engine off.
- 13 Install the limit switch and bracket assembly to the primary boom.
- 14 Remove the pressure gauge.

How to Adjust the Secondary Boom Up Relief Valve

- 1 Remove the cover retaining fasteners from the secondary boom end cover. Remove the cover from the machine.
- 2 Locate the wire connector for secondary boom limit switch LSS2AO. Disconnect the connector.

NOTICE The secondary boom limit switch LSS2AO is the upper limit switch located on the inside of the riser plate at the engine side of the machine.

- 3 Install a jumper wire between pins 3 and 4 of the LSS2AO Deutsch connector on the wire harness end.

- 4 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.
- 5 Start the engine from the ground controls.
- 6 Simultaneously push and hold the function enable/high speed button and the secondary boom up/extend button and fully raise the secondary boom.
- 7 Continue holding the function enable/high speed button and the secondary boom up/extend button while observing the reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 8 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item B).
- 9 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠ WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 10 Repeat steps 5 through 7 to confirm relief valve pressure.
- 11 Remove the pressure gauge.
- 12 Remove the jumper wire from LSS2AO limit switch connector. Connect the limit switch to the wire harness.
- 13 Install the secondary boom end cover and tighten the retaining fasteners.

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How to Adjust the Secondary Boom Down Relief Valve

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.
- 2 Start the engine from the ground controls.
- 3 Press and release the rpm select button until the engine changes to high idle.
- 4 Raise the secondary boom approximately 12 inches / 30 cm.
- 5 Place a 4 x 4 inch / 10 x 10 cm block on the secondary boom rest pad. Lower the secondary boom onto the block.

WARNING Crushing hazard. Keep hands clear of the block when lowering the secondary boom.

- 6 Simultaneously push and hold the function enable/high speed button and the secondary boom down button. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item D).

- 8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 9 Start the engine and repeat step to confirm relief valve pressure.
- 10 Start the engine and raise the secondary boom approximately 12 inches / 30 cm. Remove the block and lower the secondary boom to the stowed position.
- 11 Turn the engine off and remove the pressure gauge.

How to Adjust the Secondary Boom Extend Relief Valve

NOTICE Perform this procedure with the secondary boom fully raised.

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.
- 2 Start the engine from the ground controls.
- 3 Simultaneously push and hold the function enable/high speed button and the secondary boom up/extend button with the secondary boom fully raised and extended. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.

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- 4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item Q).
- 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 6 Repeat steps 2 through 5 to confirm relief valve pressure.
- 7 Remove the pressure gauge.

- 4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AG).
- 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 6 Repeat steps 2 through 3 to confirm relief valve pressure.
- 7 Remove the pressure gauge.

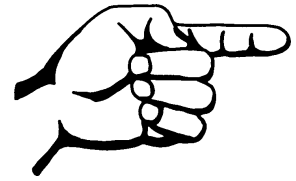
How to Adjust the Platform Manifold Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the PTEST 2 port on the function manifold.
- 2 Start the engine from the ground controls.
- 3 Simultaneously push and hold the function enable/high speed button and the jib boom down button with the jib boom fully lowered. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications*.

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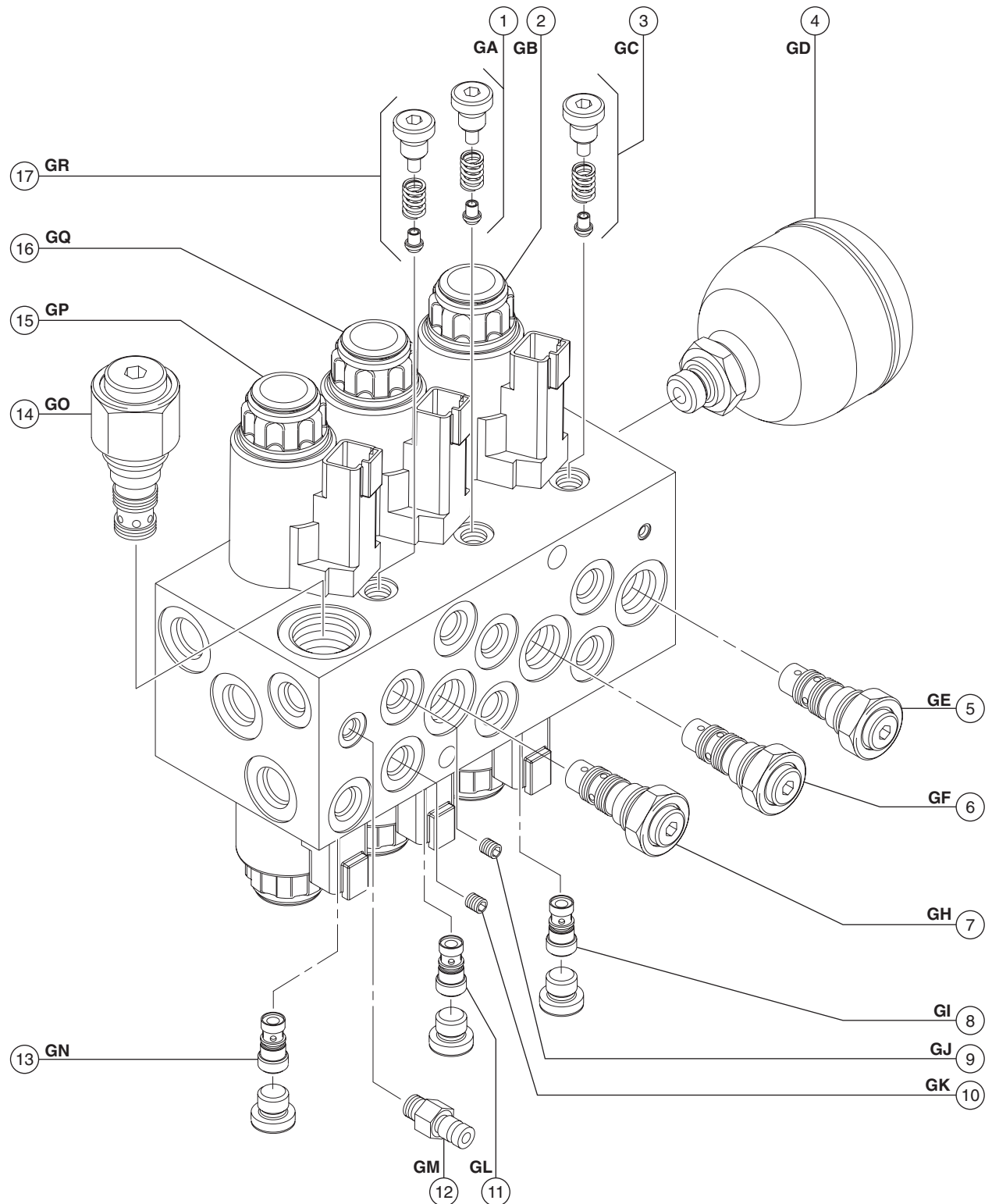
Platform Manifold

The platform Manifold is mounted to the platform mounting weldment.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve	GA	Platform level circuit	
2	Proportional solenoid valve, 3 position 4 way	GB	Jib boom up/down	
—	Core Tube, Top			7.5-9 ft-lbs / 10-12 Nm
—	Core Tube, Bottom			3.7-4.5 ft-lbs / 5-6 Nm
—	Coil Nut			3.7-4.5 ft-lbs / 5-6 Nm (Hand Tighten Only)
3	Check valve	GC	Jib boom circuit	
4	Accumulator, 500 psi / 34.5 bar	GD	Hydraulic dampening	23 ft-lbs / 31 Nm
5	Differential sensing valve, N.O.	GE	Jib boom differential sensing circuit	23-25 ft-lbs / 31-34 Nm
6	Differential sensing valve, N.O.	GF	Platform level differential sensing circuit	23-25 ft-lbs / 31-34 Nm
7	Differential sensing valve, N.O.	GH	Platform rotate differential sensing circuit	23-25 ft-lbs / 31-34 Nm
8	Shuttle valve	GI	Jib boom load sense circuit	7.5-9 ft-lbs / 10-12 Nm
9	Orifice plug, 0.030 inch / 0.762 mm ...	GJ	Platform rotate left circuit	
10	Orifice plug, 0.030 inch / 0.762 mm ...	GK	Platform rotate right circuit	
11	Shuttle valve	GL	Platform level load sense circuit	7.5-9 ft-lbs / 10-12 Nm
12	Diagnostic nipple	GM	Testing	
13	Shuttle valve	GN	Platform rotate load sense circuit	7.5-9 ft-lbs / 10-12 Nm
14	Differential sensing valve, N.C.	GO	Directs flow to functions	23-25 ft-lbs / 31-34 Nm
15	Proportional solenoid valve, 3 position 4 way	GP	Platform rotate left/right	
—	Core Tube, Top			7.5-9 ft-lbs / 10-12 Nm
—	Core Tube, Bottom			3.7-4.5 ft-lbs / 5-6 Nm
—	Coil Nut			3.7-4.5 ft-lbs / 5-6 Nm (Hand Tighten Only)
16	Proportional solenoid valve, 3 position 4 way	GQ	Platform level up/down	
—	Core Tube, Top			7.5-9 ft-lbs / 10-12 Nm
—	Core Tube, Bottom			3.7-4.5 ft-lbs / 5-6 Nm
—	Coil Nut			3.7-4.5 ft-lbs / 5-6 Nm (Hand Tighten Only)
17	Check valve	GR	Platform rotate circuit	

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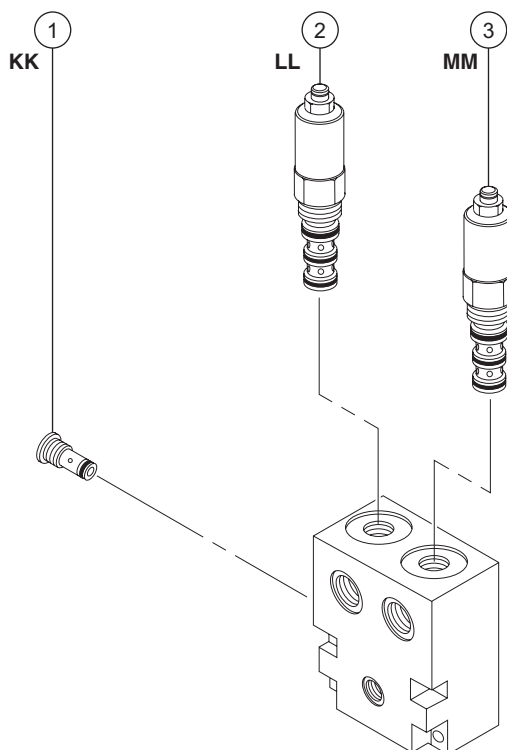
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8-5**Turntable Rotation Manifold**

The turntable rotation manifold is mounted to the turntable rotation motor located in the boom storage compartment.

Index No.	Description	Schematic Item	Function	Torque
1	Shuttle valve, 2 position 3 way	KK	Turntable rotation brake release	10-13 ft-lbs / 14-18 Nm
2	Counterbalance valve	LL	Turntable rotate right	35-40 ft-lbs / 47-54 Nm
3	Counterbalance valve	MM	Turntable rotate left	35-40 ft-lbs / 47-54 Nm



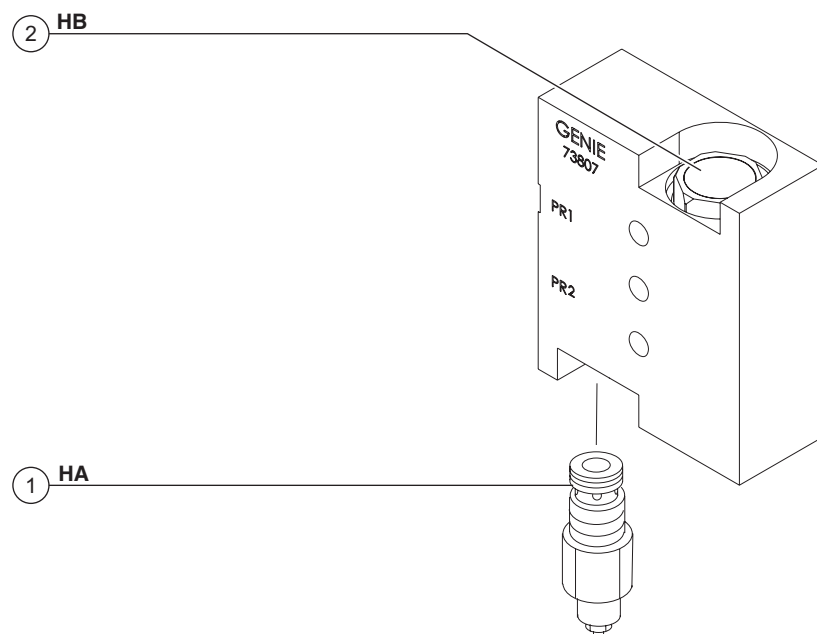
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8-6 Platform Rotate Manifold

The turntable rotation manifold is mounted to the turntable rotation motor located in the boom storage compartment.

Index No.	Description	Schematic Item	Function	Torque
1	Counterbalance valve	HA	Turntable rotation brake release	35-40 ft-lbs / 47-54 Nm
2	Counterbalance valve	HB	Turntable rotate left	35-40 ft-lbs / 47-54 Nm



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8-7**Two Wheel Steer and Oscillate Manifold**

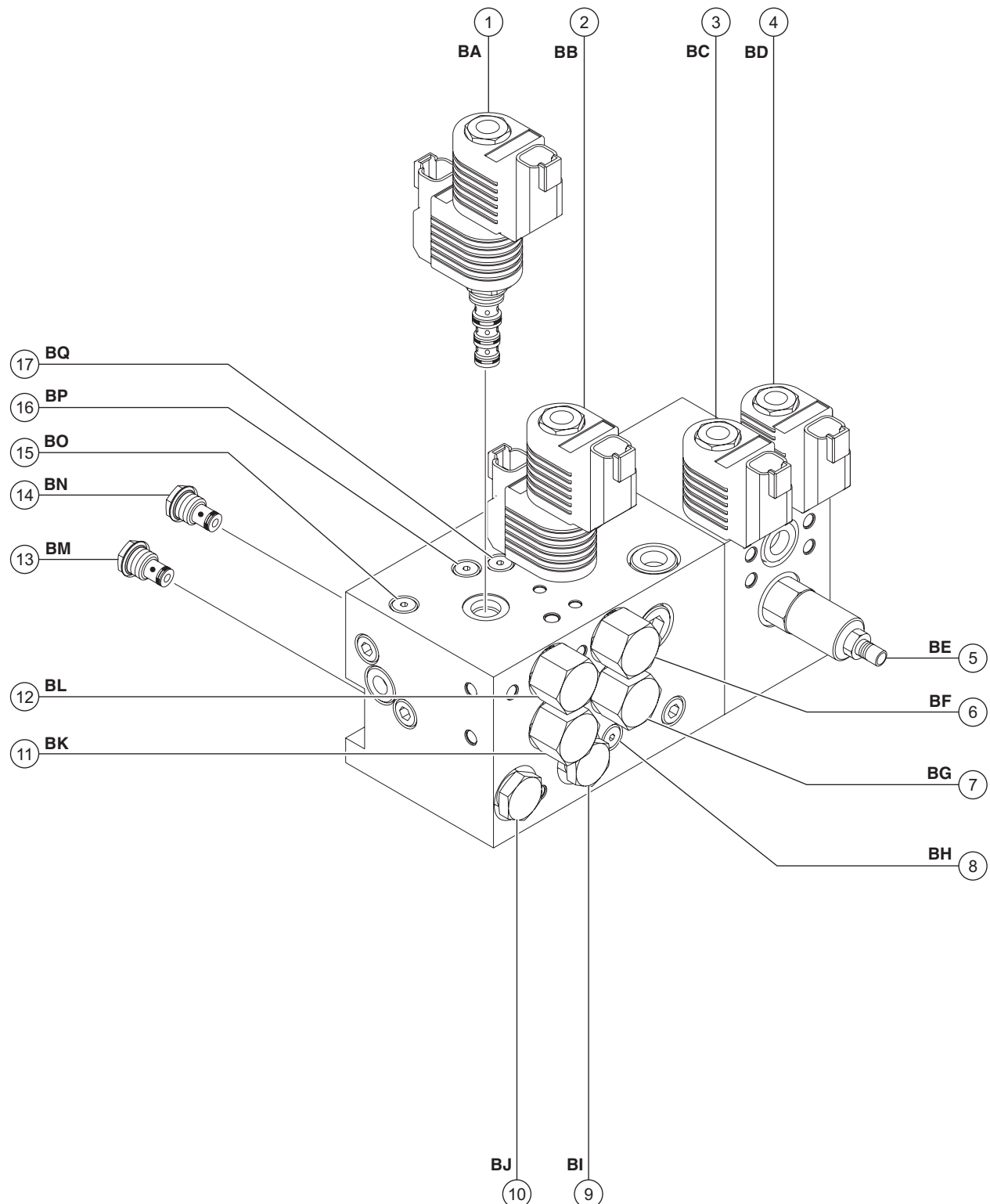
The Two Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	BA	Steer left/right, right side steer cylinder	26-30 ft-lbs / 35-41 Nm
2	Solenoid valve, 3 position 4 way	BB	Steer left/right, left side steer cylinder	26-30 ft-lbs / 35-41 Nm
3	Solenoid valve, 2 position 3 way	BC	Oscillate cylinder, left side	26-30 ft-lbs / 35-41 Nm
4	Solenoid valve, 2 position 3 way	BD	Oscillate cylinder, right side	26-30 ft-lbs / 35-41 Nm
5	Relief valve, 750 to 860 psi / 51.71 to 59.3 bar	BE	Oscillate circuit	20-25 ft-lbs / 27-34 Nm
6	Flow regulator valve, 2.3 gpm / 8.7 L/min	BF	Left side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
7	Flow regulator valve, 1.2 gpm / 4.5 L/min (before software revision 1.04) 1.5 gpm / 5.7 L/min (after software revision 1.03)	BG	Left side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
8	Check valve	BH	Load sensing circuit, left side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
9	Check valve	BI	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
10	Check valve	BJ	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
11	Flow regulator valve, 2.3 gpm / 8.7 L/min	BK	Right side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
12	Flow regulator valve, 1.2 gpm / 4.5 L/min (before software revision 1.04) 1.5 gpm / 5.7 L/min (after software revision 1.03)	BL	Right side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
13	Check valve, 65 psi / 4.5 bar	BM	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
14	Check valve, 65 psi / 4.5 bar	BN	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm

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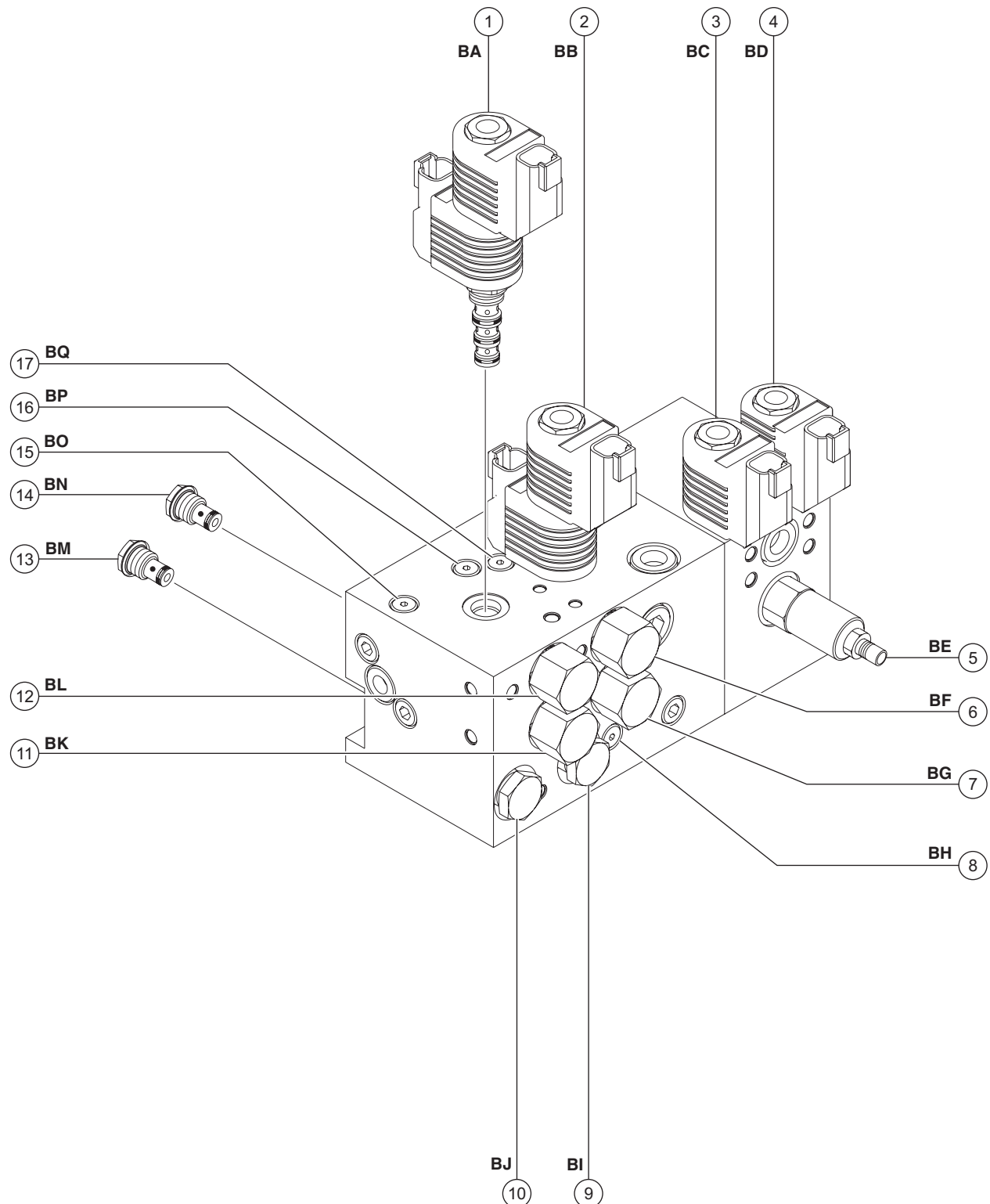
REV C

Two Wheel Steer and Oscillate Manifold, continued

Index No.	Description	Schematic Item	Function	Torque
15	Check valve	BO	Load sensing circuit, right side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
16	Check valve	BP	Load sensing circuit, right side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
17	Check valve	BQ	Load sensing circuit, left side steer cylinder extend	8-10 ft-lbs / 11-14 Nm

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How to Adjust the Oscillate Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE Perform this procedure with the engine running at high RPM.

NOTICE This procedure will require two people.

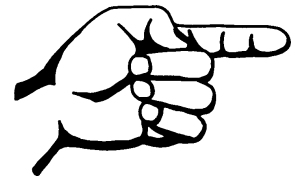
- 1 Remove the drive chassis cover from the square-end of the machine.
- 2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the two wheel steer and oscillate manifold.
- 3 Start the engine from the platform controls.
- 4 Press down the foot switch and manually activate one of the oscillate limit switches. Hold the switch in the activated position and observe the reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 5 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item BE).
- 6 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 7 Repeat steps 3 through 4 to confirm relief valve pressure.
- 8 Remove the pressure gauge.
- 9 Install the drive chassis cover.

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8-8**Four Wheel Steer and Oscillate Manifold**

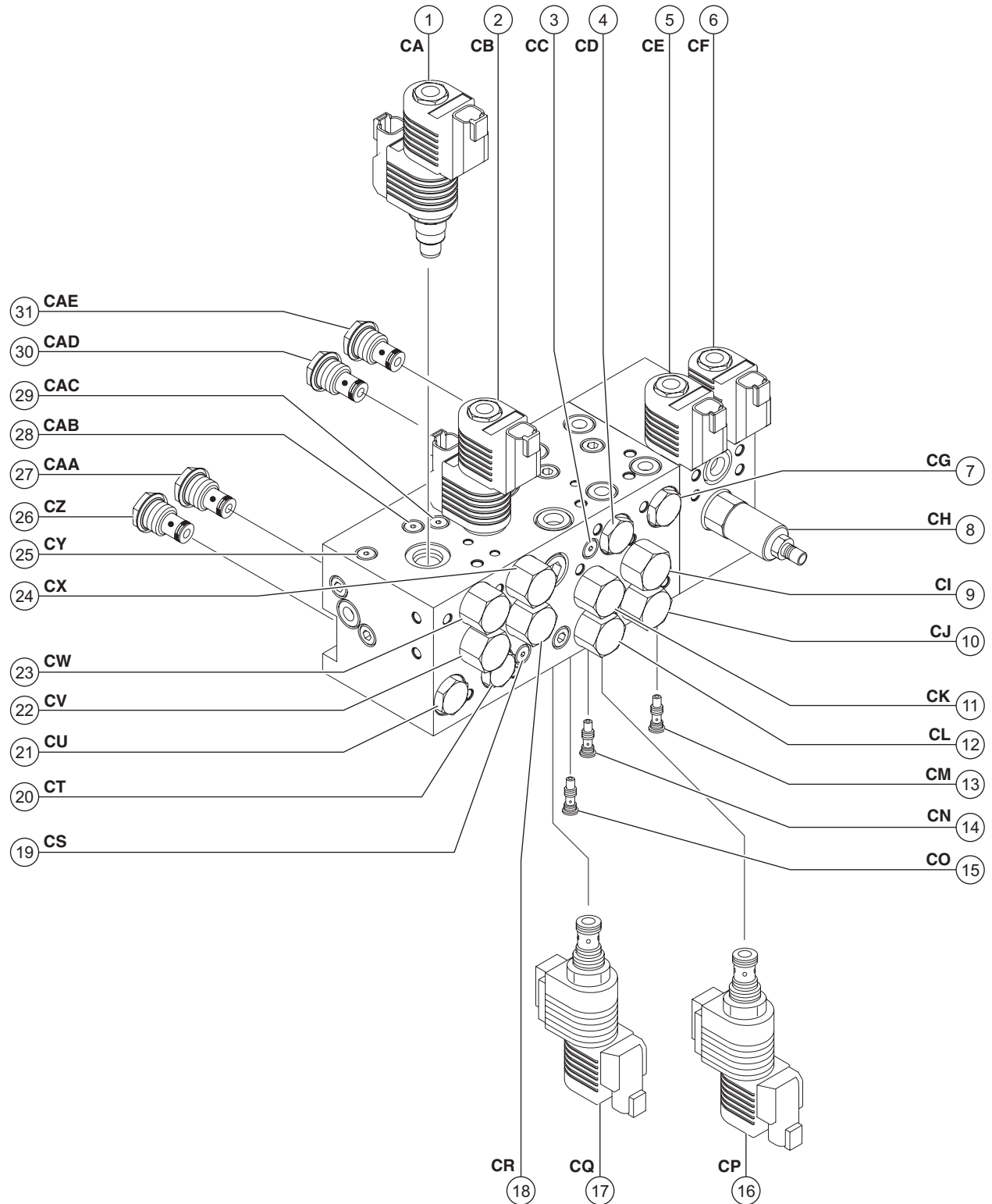
The Four Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	CA	Steer left/right, square end right side steer cylinder	26-30 ft-lbs / 35-41 Nm
2	Solenoid valve, 3 position 4 way	CB	Steer left/right, square end left side steer cylinder	26-30 ft-lbs / 35-41 Nm
3	Check valve	CC	Load sensing circuit, circle end right side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
4	Check valve, 65 psi / 4.5 bar	CD	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
5	Solenoid valve, 2 position 3 way	CE	Oscillate cylinder, left side	26-30 ft-lbs / 35-41 Nm
6	Solenoid valve, 2 position 3 way	CF	Oscillate cylinder, right side	26-30 ft-lbs / 35-41 Nm
7	Check valve, 65 psi / 4.5 bar	CG	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
8	Relief valve, 750 to 860 psi / 51.71 to 59.3 bar	CH	Oscillate circuit	20-25 ft-lbs / 27-34 Nm
9	Flow regulator valve, 2.3 gpm / 8.7 L/min	CI	Circle end, left side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
10	Flow regulator valve, 1.2 gpm / 4.5 L/min (before software revision 1.04) 1.5 gpm / 5.7 L/min (after software revision 1.03)	CJ	Circle end, left side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
11	Flow regulator valve, 1.2 gpm / 4.5 L/min (before software revision 1.04) 1.5 gpm / 5.7 L/min (after software revision 1.03)	CK	Circle end, right side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
12	Flow regulator valve, 2.3 gpm / 8.7 L/min	CL	Circle end, right side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
13	Check valve	CM	Load sensing circuit, circle end left side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
14	Check valve	CN	Load sensing circuit, circle end left side steer cylinder extend	8-10 ft-lbs / 11-14 Nm

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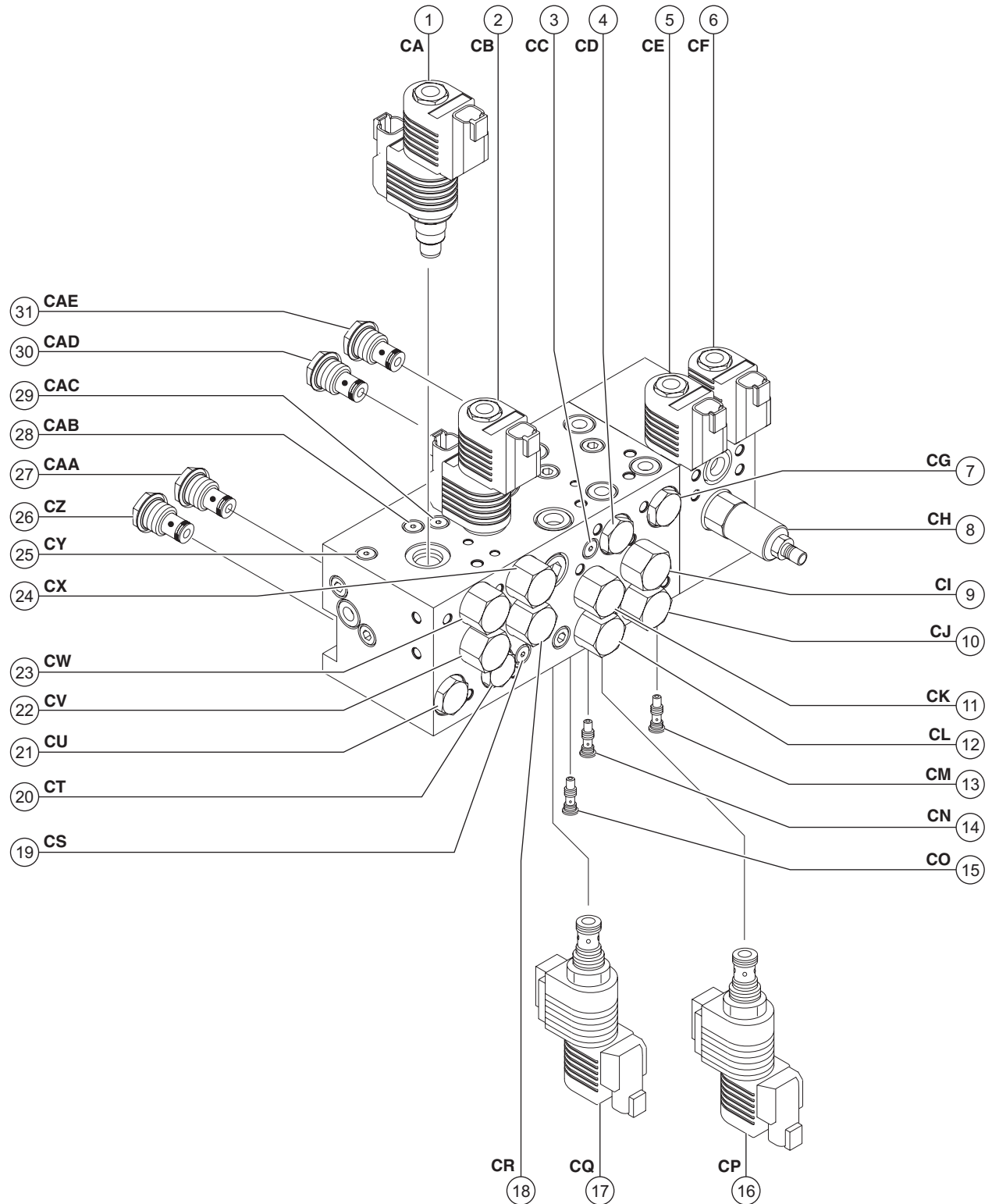
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Four Wheel Steer and Oscillate Manifold, continued

Index No.	Description	Schematic Item	Function	Torque
15	Check valve	CO	Load sensing circuit, circle end right side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
16	Solenoid valve, 3 position 4 way	CP	Steer left/right, circle end left side steer cylinder	26-30 ft-lbs / 35-41 Nm
17	Solenoid valve, 3 position 4 way	CQ	Steer left/right, circle end right side steer cylinder	26-30 ft-lbs / 35-41 Nm
18	Flow regulator valve, 1.2 gpm / 4.5 L/min	CR	Square end, left side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
19	Check valve	CS	Load sensing circuit, square end left side steer cylinder retract	20-25 ft-lbs / 27-34 Nm
20	Check valve, 65 psi / 4.5 bar	CT	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
21	Check valve, 65 psi / 4.5 bar	CU	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
22	Flow regulator valve, 2.3 gpm / 8.7 L/min	CV	Square end, right side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
23	Flow regulator valve, 1.2 gpm / 4.5 L/min (before software revision 1.04) 1.5 gpm / 5.7 L/min (after software revision 1.03)	CW	Square end, right side steer cylinder retract circuit	26-30 ft-lbs / 35-41 Nm
24	Flow regulator valve, 2.3 gpm / 8.7 L/min	CX	Square end, left side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
25	Check valve	CY	Load sensing circuit, square end right side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
26	Check valve, 65 psi / 4.5 bar	CZ	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
27	Check valve, 65 psi / 4.5 bar	CAA	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
28	Check valve	CAB	Load sensing circuit, square end right side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
29	Check valve	CAC	Load sensing circuit, square end left side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
30	Check valve, 65 psi / 4.5 bar	CAD	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
31	Check valve, 65 psi / 4.5 bar	CAE	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm

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How to Adjust the Oscillate Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE This procedure will require two people.

- 1 Remove the drive chassis cover from the square-end of the machine.
- 2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the steer/oscillate manifold.
- 3 Start the engine from the platform controls.
- 4 Press down the foot switch and manually activate one of the oscillate limit switches. Hold the switch in the activated position and observe the reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 5 Turn the engine off. Use a wrench to hold the relief valve and loosen the jam nut. (item CH).
- 6 Adjust the stud with a hex wrench. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

- 7 Repeat steps 3 through 4 to confirm relief valve pressure.
- 8 Remove the pressure gauge.
- 9 Install the drive chassis cover.

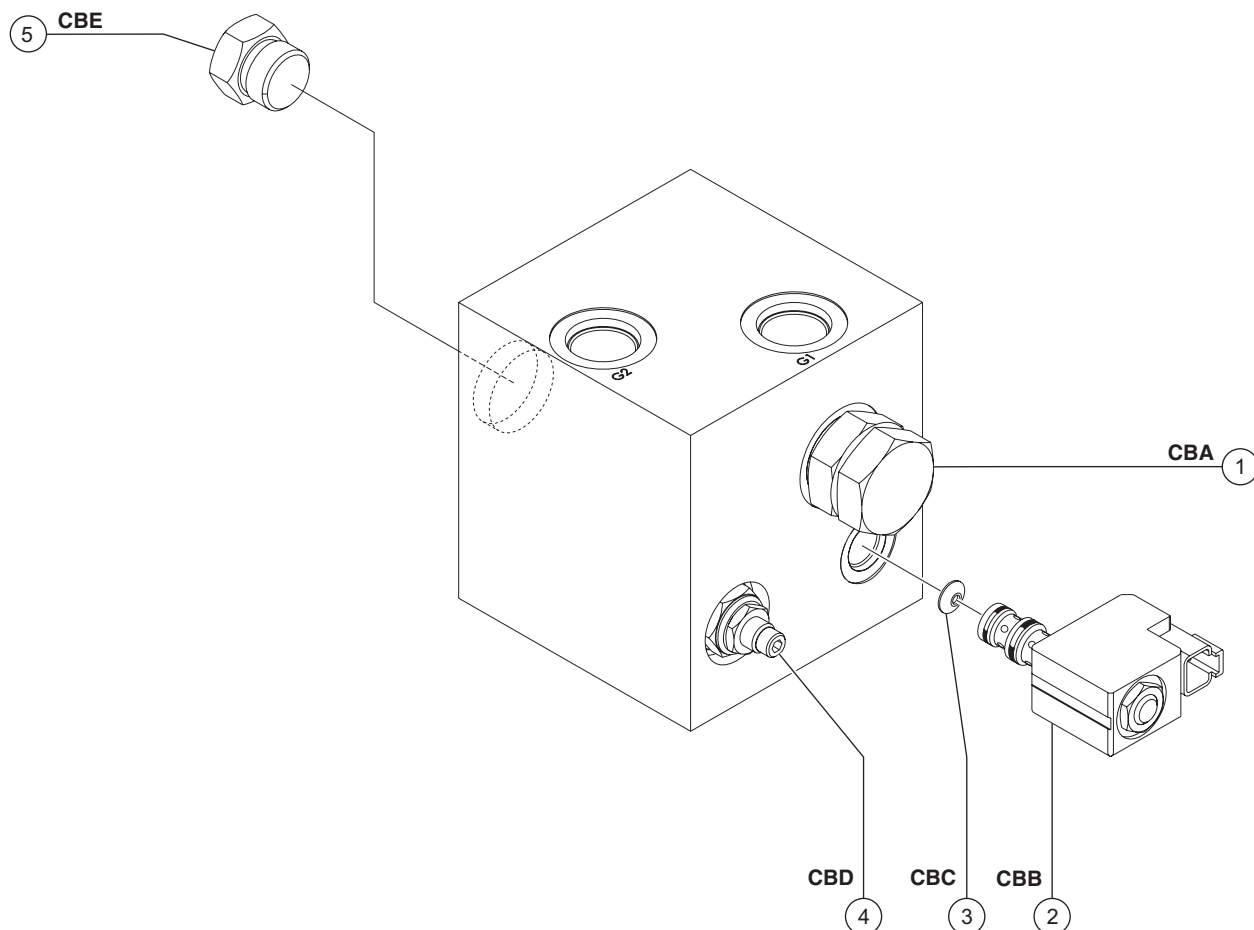
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8-9**Oil Diverter Manifold Components (welder option)**

The oil diverter manifold is mounted to the hydraulic generator located in the engine compartment.

Index No.	Description	Schematic Item	Function	Torque
1	Pilot Operated Directional valve, 2 position 3 way	CBA	Activates generator	80-90 ft-lbs / 108-122 Nm
2	Solenoid valve, 2 position 3 way ...	CBB	Pilot valve to diverter	35-40 ft-lbs / 47-54 Nm
3	Orifice disc, 0.031 inch / 0.79 mm	CBC	Delays shift to drive	35-40 ft-lbs / 47-54 Nm
4	Relief valve, 270 psi @ 3.5 gpm / 18.6 bar @ 13.2 L/min	CBD	Charge pressure circuit	35-40 ft-lbs / 47-54 Nm
5	Check valve	CBE	Prevents oil flowing into generator ..	35-40 ft-lbs / 47-54 Nm



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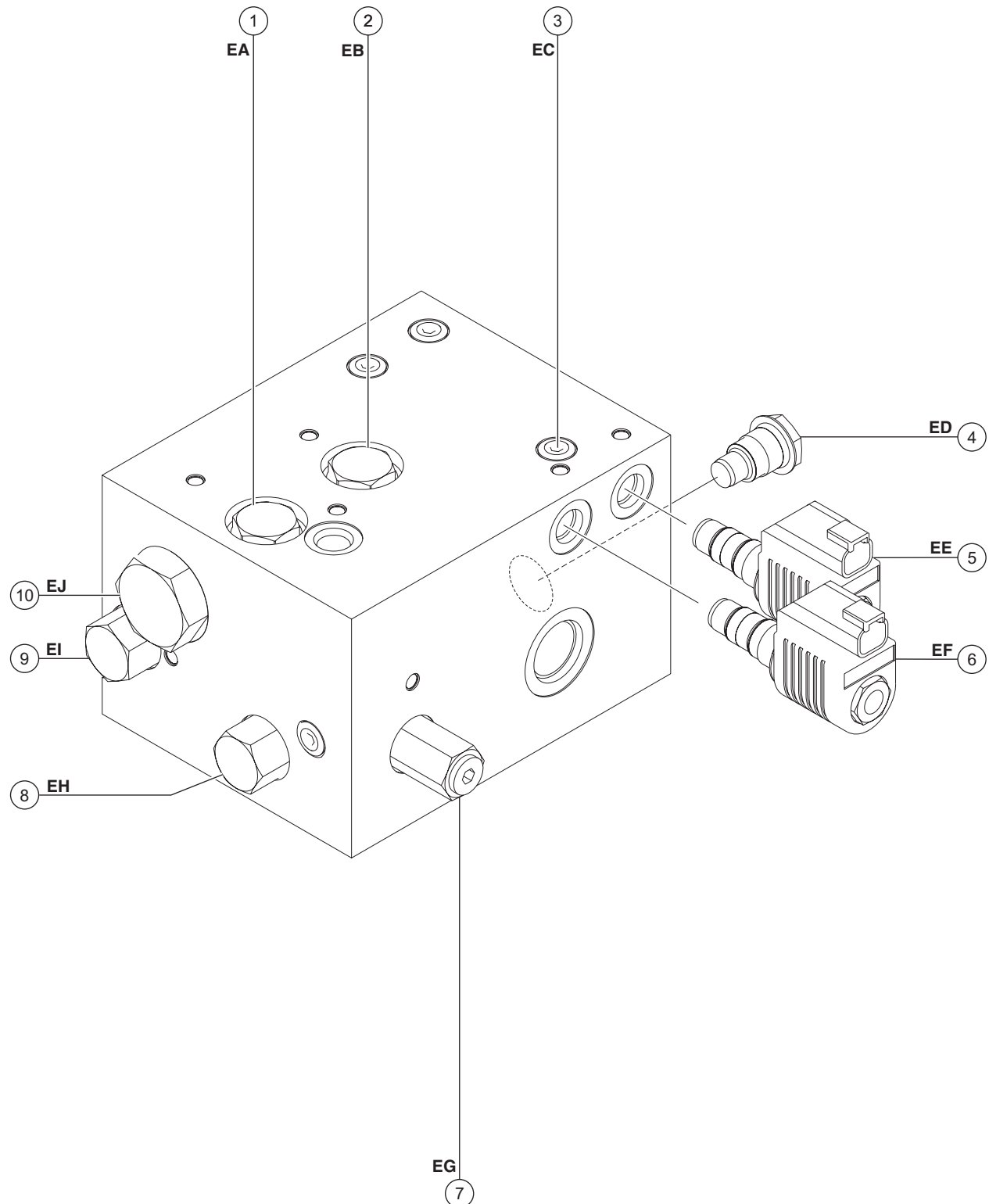
8-10**Traction Manifold, 2WD**

The 2WD traction manifold is mounted inside the drive chassis at the circle-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.34 bar	EA	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
2	Check valve, 5 psi / 0.34 bar	EB	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
3	Orifice, 0.031 in / 0.79 mm	EC	Brake and 2-speed circuit	
4	Check valve	ED	Keeps brakes released in case of temporary loss of charge pressure ...	20-25 ft-lbs / 27-34 Nm
5	Solenoid valve, 2 position 3 way	EE	Brake release	26-30 ft-lbs / 35-41 Nm
6	Solenoid valve, 2 position 3 way	EF	2-speed drive motor shift	26-30 ft-lbs / 35-41 Nm
7	Relief valve, 250 psi / 17.2 bar	EG	Charge pressure circuit	20-25 ft-lbs / 27-34 Nm
8	Shuttle valve, 3 position 3 way	EH	Charge pressure circuit that directs hot oil out of low pressure side of drive pump	30-35 ft-lbs / 41-47 Nm
9	Bi-directional flow control valve, 4.5 gpm / 17 L/min	EI	Equalizes pressure on both sides of divider/combiner valve EJ	30-35 ft-lbs / 41-47 Nm
10	Flow divider/combiner valve	EJ	Controls flow to drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm

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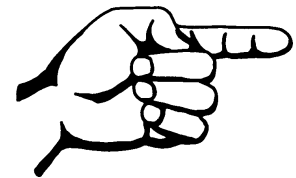
8-11**Valve Adjustments, 2WD
Traction Manifold****How to Adjust the Charge
Pressure Relief Valve**

NOTICE Perform this procedure with the hydraulic oil temperature from 100°F to 150°F / 38°C to 65.5°C.

- 1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.
- 2 Use a wrench to hold the charge pressure relief valve and remove the cap (item EG).
- 3 Turn the internal hex socket fully in a clockwise direction until it stops. Install the cap.
- 4 Start the engine from the ground controls.
- 5 Press and hold the function enable/high rpm select button (rabbit symbol) position. Note the reading on the pressure gauge.
- 6 Turn the engine off.
- 7 Remove the pressure gauge from the drive pump. Connect the gauge to the test port located on the drive manifold.
- 8 Use a wrench to hold the charge pressure relief valve and remove the cap from the valve (item EG).
- 9 Start the engine from the ground controls.
- 10 Press and hold the function enable/high rpm select button (rabbit symbol) position.
- 11 Adjust the internal hex socket until the pressure reading on the gauge is 40 psi / 2.8 bar less than the pressure reading taken in step 5. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the valve cap.
- 12 Turn the engine off and remove the pressure gauge.

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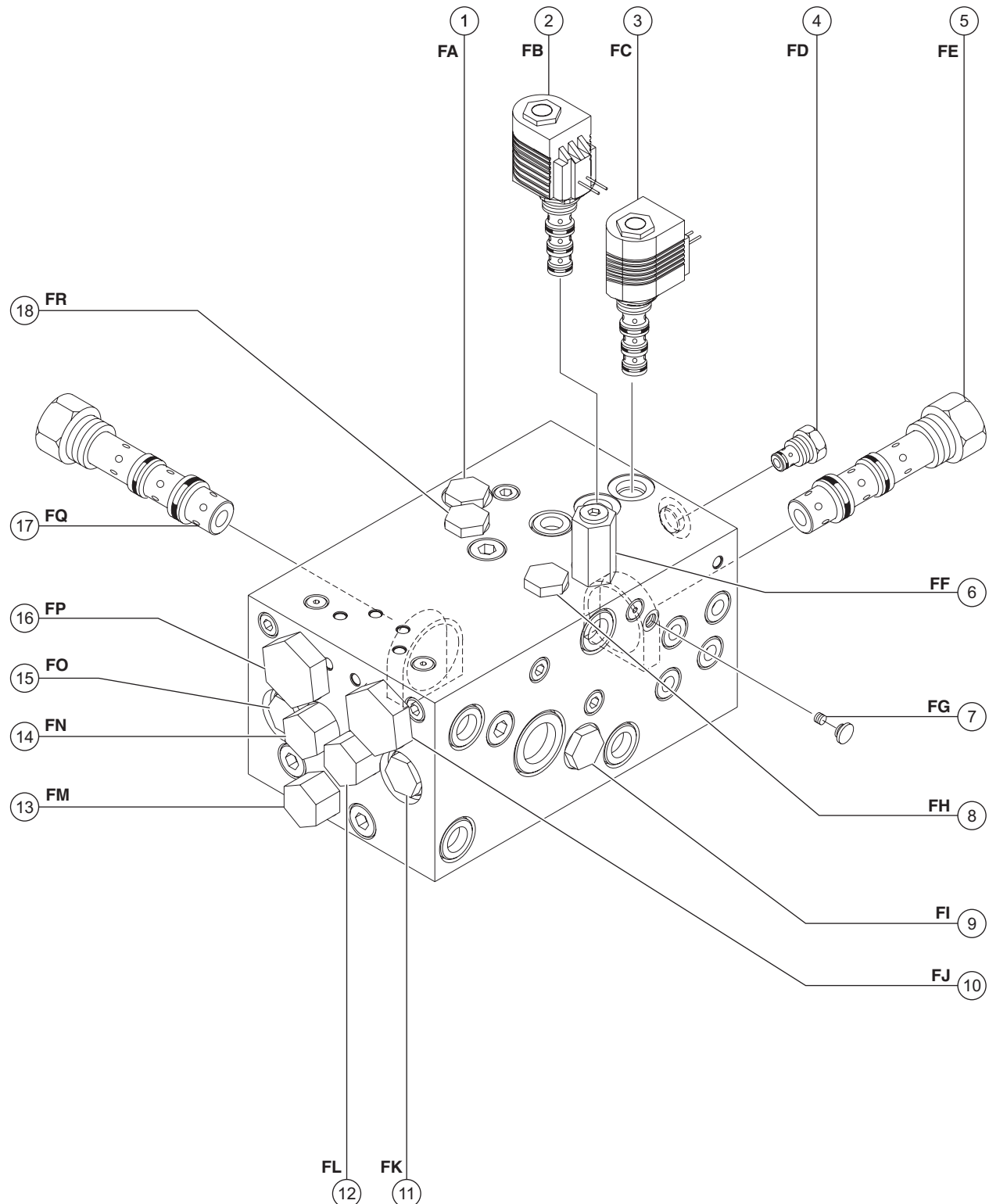
8-12**Traction Manifold, 4WD**

The 4WD traction manifold is mounted inside the drive chassis at the circle-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.34 bar	FA	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
2	Solenoid valve, 2 position 3 way	FB	2-speed drive motor shift	26-30 ft-lbs / 35-41 Nm
3	Solenoid valve, 2 position 3 way	FC	Brake release	26-30 ft-lbs / 35-41 Nm
4	Check valve	FD	Keeps brakes released in case of temporary loss of charge pressure ...	20-25 ft-lbs / 27-34 Nm
5	Shuttle valve, 3 position 3 way	FE	Charge pressure circuit that directs hot oil out of low pressure side of drive pump	30-35 ft-lbs / 41-47 Nm
6	Relief valve, 250 psi / 17.2 bar	FF	Charge pressure circuit	20-25 ft-lbs / 27-34 Nm
7	Orifice, 0.030 in / 0.76 mm	FG	Brake and 2-speed circuit	
8	Check valve	FH	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
9	Check valve	FI	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
10	Flow divider/combiner valve	FJ	Controls flow to square end drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm
11	Check valve, 5 psi / 0.34 bar	FK	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
12	Bi-directional flow control valve, 2 gpm / 7.6 L/min	FL	Equalizes pressure on both sides of divider/combiner valve FJ	30-35 ft-lbs / 41-47 Nm
13	Bi-directional flow control valve, 2 gpm / 7.6 L/min	FM	Equalizes pressure on both sides of divider/combiner valve FQ	30-35 ft-lbs / 41-47 Nm
14	Bi-directional flow control valve, 2 gpm / 7.6 L/min	FN	Equalizes pressure on both sides of divider/combiner valve FP	30-35 ft-lbs / 41-47 Nm
15	Check valve	FO	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
16	Flow divider/combiner valve	FP	Controls flow to circle end drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm
17	Flow divider/combiner valve	FQ	Controls flow to divider/combiner valves FJ and FP	90-100 ft-lbs / 122-136 Nm
18	Check valve	FR	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm

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Valve Adjustments, 4WD Traction Manifold

How to Adjust the Charge Pressure Relief Valve

NOTICE Perform this procedure with the hydraulic oil temperature must be 100°F to 150°F / 38°C to 65.5°C.

- 1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.
- 2 Use a wrench to hold the charge pressure relief valve and remove the cap (item FF).
- 3 Turn the internal hex socket fully in a clockwise direction until it stops. Install the cap.
- 4 Start the engine from the ground controls.
- 5 Press and hold the function enable/high rpm select button (rabbit symbol) position. Note the reading on the pressure gauge.
- 6 Turn the engine off.
- 7 Remove the pressure gauge from the drive pump. Connect the gauge to the test port located on the drive manifold.
- 8 Use a wrench to hold the charge pressure relief valve and remove the cap from the valve (item FF).
- 9 Start the engine from the ground controls.
- 10 Press and hold the function enable/high rpm select button (rabbit symbol).
- 11 Adjust the internal hex socket until the pressure reading on the gauge is 40 psi / 2.8 bar less than the pressure reading taken in step 5. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the valve cap.
- 12 Turn the engine off and remove the pressure gauge.

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8-14 Valve Coils

How to Test a Coil

A properly functioning coil provides an electromotive force which operates the solenoid valve. Critical to normal operation is continuity within the coil that provides this force field.

⚠ WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 1 Tag and disconnect the wiring from the coil to be tested.
 - 2 Test the coil resistance.
- ⦿ Result: The resistance should be within specification, plus or minus 30%.
 - ⦿ Result: If the resistance is not within specification, plus or minus 30%, replace the coil.

How to Test a Coil Diode

Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

⚠ WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 1 Test the coil for resistance. See 8-14, *How to Test a Coil*.

Valve coil resistance specifications

Proportional solenoid valve, 12V DC (schematic items G, R and BB)	4 to 6Ω
3 position 4 way solenoid valve, 12V DC (schematic items GB, GP and GQ)	4.5 to 6.5Ω
3 position 4 way solenoid valve, 10V DC (schematic items O, S, BA, BB, CA, CB, CP and CQ)	5 to 7Ω
2 position 2 way solenoid valve, 10V DC (schematic items C and P)	5.5 to 7.5Ω
2 position 3 way solenoid valve, 10V DC (schematic items H, J, V, X, Z, AA, BC, BD, CE, CF, EE, EF, FB and FC)	4.5 to 6.5Ω

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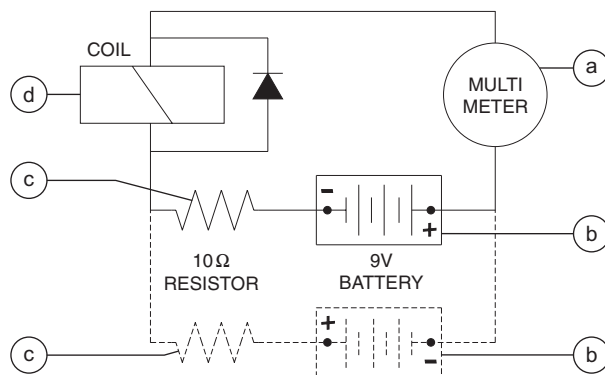
- 2 Connect a 10 Ω resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Resistor, 10 Ω

Genie part number

27287

NOTICE The battery should read 9V DC or more when measured across the terminals.



- a multimeter
- b 9V DC battery
- c 10 Ω resistor
- d coil

Note: Dotted lines in illustration indicate a reversed connection as specified in step 6

- 3 Set a multimeter to read DC current.

NOTICE The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

- 4 Connect the negative lead to the other terminal on the coil.
 - 5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the current reading.
 - 6 At the battery or coil terminals, reverse the connections. Note and record the current reading.
- ⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.
 - ✗ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

REV B

Turntable Rotation Components

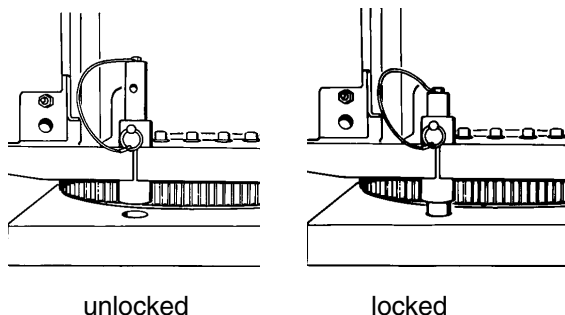
9-1 Turntable Rotation Assembly

How to Remove a Turntable Rotation Assembly

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

NOTICE Perform this procedure with the platform between the circle-end tires and with the machine on a firm, level surface.

- 1 Secure the turntable from rotating with the turntable rotation lock pin.



- 2 Remove the ground controls side fixed turntable cover.

- 3 Tag, disconnect the hydraulic hoses from the turntable rotation motor. Cap the fittings on the motor.
- 4 Attach a lifting strap from an overhead crane or other suitable lifting device to the lifting eye on the turntable rotation assembly.
- 5 Remove the turntable rotator mounting bolts and remove the turntable rotation assembly from the machine.
- 6 Repeat steps 3 through 5 for the other turntable rotation assembly.

⚠ DANGER Tip-over hazard. If the turntable rotation lock pin is not properly installed, machine stability is compromised and the machine could tip over when the drive hub is removed from the machine, which could result in death or serious injury.

⚠ WARNING Crushing hazard. The drive hub could become unbalanced and fall if not properly supported by the overhead crane or lifting device when removed from the machine.

NOTICE When installing a turntable rotation assembly, the rotation gear backlash must be adjusted. See 9-1, *Adjust the Turntable Rotation Gear Backlash*.

TURNABLE ROTATION COMPONENTS

REV B

How to Adjust the Turntable Rotation Gear Backlash

The turntable rotation drive hub is mounted on an adjustable plate that controls the gap between the rotation motor pinion gear and the turntable bearing ring gear.

NOTICE Perform this procedure with the platform between the circle-end tires and with the machine on a firm, level surface.

- 1 Secure the turntable from rotating with the turntable rotation lock pin.
- 2 Loosen the backlash pivot plate mounting fasteners.
- 3 Push the backlash pivot plate towards the turntable as far as possible (this will push the rotation gear into the turntable bearing ring gear).
- 4 Loosen the lock nut on the adjustment bolt.
- 5 Turn the adjustment bolt clockwise until it contacts the backlash pivot plate.
- 6 Turn the adjustment bolt $\frac{1}{2}$ turn counterclockwise. Tighten the lock nut on the adjustment bolt.
- 7 Rotate the backlash pivot plate away from the turntable until it contacts the adjustment bolt. Torque the mounting fasteners on the backlash pivot plate to specification. Refer to Section 2, *Specifications*.
- 8 Rotate the turntable through an entire rotation. Check for tight spots that could cause binding. Readjust if necessary.

Axle Components

REV C

10-1 Hub and Bearings, 2WD Models

How to Remove the Hub and Bearings, 2WD Models

- 1 Loosen the wheel lug nuts. Do not remove them.
- 2 Block the non-steer wheels.
- 3 Center a lifting jack with a minimum capacity of 25,000 lbs / 12000 kg under the drive chassis between the steer wheels.
- 4 Raise the machine 6 inches / 15 cm and place blocks under the chassis for support.

CAUTION Crushing hazard. The machine may fall if not properly supported.

- 5 Remove the lug nuts. Remove the tire and wheel assembly.
- 6 Remove the dust cap, cotter pin and castle nut.

NOTICE Always use a new cotter pin when installing a castle nut.

- 7 Pull the hub off the spindle. The washer and outer bearing should fall loose from the hub.
- 8 Place the hub on a flat surface and gently pry the bearing seal out of the hub.
- 9 Remove the rear bearing.

How to Install the Hub and Bearings, 2WD Models

NOTICE When replacing a wheel bearing, both the inner and outer bearings including the pressed-in races must be replaced.

- 1 Be sure that both bearings are packed with clean, fresh grease.
- 2 Place the large inner bearing into the rear of the hub.
- 3 Press the bearing seal evenly into the hub until it is flush.
- 4 Slide the hub onto the yoke spindle.

CAUTION Component damage. Do not apply excessive force or damage to the lip of the seal may occur.

- 5 Place the outer bearing into the hub.
- 6 Install the washer and castle nut.
- 7 Tighten the castle nut to 35 ft-lbs / 47 Nm to seat the bearing.
- 8 Fully loosen the castle nut, then re-tighten to 8 ft-lbs / 11 Nm.
- 9 Install a new cotter pin. Bend the cotter pin to secure the castle nut.

NOTICE Always use a new cotter pin when installing a castle nut.

- 10 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to specification. Refer to Section 2, *Specifications*.

AXLE COMPONENTS

REV C

How to Adjust the Oscillate Limit Switches

⚠ DANGER Tip-over hazard. Failure to perform this procedure on a firm, level surface will compromise the stability of the machine and could cause the machine to tip over which could result in death or serious injury.

NOTICE Perform this procedure with the machine on a firm, level surface that is free of obstructions. Use a digital level to confirm.

NOTICE This procedure will require two people.

- 1 Lower the boom to the stowed position.
- 2 Remove the drive chassis cover from the circle-end of the machine.
- 3 Remove the oscillate axle limit switch mounting fasteners. Remove the limit switches.

NOTICE The oscillate axle limit switches are located inside the drive chassis above the axle.

- 4 Place a digital level on the turntable rotate bearing plate.
- 5 Start the engine and level the drive chassis. Press down the foot switch and manually activate the oscillate limit switches until the machine is completely level.

- 6 Loosely install the limit switches. Using a feeler gauge, establish a gap of 0.015 - 0.030 inches / 0.381 - 0.762 mm between the limit switch plunger and the top of the axle.
 - 7 Carefully hold the position of each limit switch and tighten the limit switch mounting fasteners.
 - 8 Verify the gap is 0.015 - 0.030 inches / 0.381 - 0.762 mm between the limit switch plunger and the top of the axle.
 - 9 Measure the distance between the drive chassis and the axle on both sides (from the inside of the drive chassis).
- Ⓞ Result: The measurements should be equal.

NOTICE If the distance is not equal and the adjustment to the limit switches was completed with the ground and drive chassis level, consult Genie Industries Service Department.

REV C

AXLE COMPONENTS

10-2 Oscillating Axle Cylinders

The oscillating axle cylinders extend and retract between the drive chassis and the oscillating axle. The cylinders are equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure. The valves are not adjustable.

How to Remove an Oscillating Axle Cylinder

NOTICE

Perform this procedure on a firm, level surface with the boom in the stowed position.

NOTICE

When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Rotate the boom until the turntable counterweight is between the circle-end and square-end tires.

- 2 Tag, disconnect and plug the oscillating axle cylinder hydraulic hoses. Cap the fittings on the oscillate cylinder.

⚠ WARNING

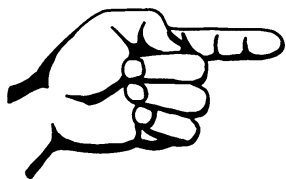
Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

- 3 Remove the pin retaining fasteners from the oscillate cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.
- 4 Attach a lifting strap from an overhead crane to the barrel end of the oscillating cylinder.
- 5 Remove the pin retaining fasteners from the oscillate cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

⚠ CAUTION

Crushing hazard. The oscillate cylinder may become unbalanced and fall if not properly supported when removed from the machine.

- 6 Remove the oscillate cylinder from the machine.



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Fault Codes



Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
 - Machine parked on a firm, level surface
 - Boom in stowed position
 - Turntable rotated with the boom between the circle-end (yellow arrow) wheels.
 - Turntable secured with the turntable rotation lock pin
 - Key switch in the off position with the key removed
 - Welder disconnected from the machine (if equipped with the weld cable to platform option)
 - Wheels chocked
 - All external AC power supply disconnected from the machine

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropriate fault code thoroughly. Attempting shortcuts may produce hazardous conditions.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

▲ DANGER

Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

▲ WARNING

Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

▲ WARNING

Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE

Two persons will be required to safely perform some troubleshooting procedures.

Control System Fault Codes

REV A

Error Source	Error Type	Effects	Recovery Actions
PRIMARY BOOM EXT/RET FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		
PRI BOOM EXT VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
PRI BOOM RET VALVE			
PRI BOOM UP VALVE			
PRI BOOM DOWN VALVE			
SEC BOOM LENGTH	Fault check (unknown length)	Stop all secondary boom functions, allow only secondary boom retract. Display message on LCD.	Power up controller with the problem corrected.
SEC BOOM ANGLE	Fault check (unknown angle)	Stop all secondary boom functions, allow only secondary boom retract. Once the boom is retracted allow secondary boom down. Display message on LCD.	Power up controller with the problem corrected.
SEC BOOM UP/DOWN SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
SEC BOOM UP/DOWN/EXT/RET FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		
SEC BOOM EXT VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
SEC BOOM RET VALVE			
SEC BOOM UP VALVE			
SEC BOOM DOWN VALVE			
SEC EXT SEQ VALVE			
SEC DWN SEQ VALVE			

REV A

CONTROL SYSTEM FAULT CODES

Error Source	Error Type	Effects	Recovery Actions
ENGINE SPEED	Range check (underspeed)	Display message on LCD.	Power up controller with the problem corrected.
OIL PRESSURE	Range check (low oil pressure)		
WATER/OIL TEMP	Range check (high temperature)		
OIL PRESSURE SENSOR	Fault check	Display message on LCD.	Power up controller with the problem corrected.
WATER/OIL TEMP SENSOR			
AXLE EXT/RET BUTTONS		Axle extend/retract disabled, display message on LCD.	Power up controller with the problem corrected.
CAN BUS	Fault check	Display message on LCD.	Power up controller with the problem corrected.
PRIMARY BOOM UP/DOWN JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick Speed and Direction frozen at zero and neutral	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
SECONDARY BOOM JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
PRIMARY EXTEND/RETRACT JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)



Continued on next page

CONTROL SYSTEM FAULT CODES

REV A

Error Source	Error Type	Effects	Recovery Actions
STEER JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
PRIMARY BOOM UP/DOWN SWITCHES ON TCON	Fault Check, (both buttons pressed)	Primary boom up/down disabled, display message on LCD.	Power up controller with the problem corrected.
SEC BOOM UP/EXT/DWN/RET SWITCHES ON TCON	Fault Check, (both buttons pressed)	Secondary boom up/extend and down/retract disabled, display message on LCD.	Power up controller with the problem corrected
PRIMARY BOOM EXT/RET SWITCHES ON TCON	Fault Check, (both buttons pressed)	Primary boom extend/retract disabled, display message on LCD.	Power up controller with the problem corrected.
PRIMARY BOOM LENGTH	Fault check (unknown length)	Display message on LCD.	Power up controller with the problem corrected.
PRIMARY BOOM ANGLE	Fault check (unknown angle)	Allow only primary boom retract and down. Display message on LCD.	Power up controller with the problem corrected.
PRIMARY UP/DOWN SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
PRIMARY EXTEND/RETRACT SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
PRIMARY BOOM UP/DOWN FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		

REV A

CONTROL SYSTEM FAULT CODES

Error Source	Error Type	Effects	Recovery Actions
SAFETY SWITCH P3	Fault check	Display message on LCD. P3 SAFETY SWITCH FAULT	Power up controller with the problem corrected.
SAFETY SWITCH P6R1		Display message on LCD. P6R1 SAFETY SWITCH FAULT	
SAFETY SWITCH P6R2		Display message on LCD. P6R2 SAFETY SWITCH FAULT	
SAFETY SWITCH P7		Display message on LCD. P7 SAFETY SWITCH FAULT	
SAFETY SWITCH P7R		Display message on LCD. P7R SAFETY SWITCH FAULT	
SAFETY SWITCH P9A		Display message on LCD. P9A SAFETY SWITCH FAULT	
SAFETY SWITCH P9B		Display message on LCD. P9B SAFETY SWITCH FAULT	
SAFETY SWITCH P10		Display message on LCD. P10 SAFETY SWITCH FAULT	
SAFETY SWITCH P11		Display message on LCD. P11 SAFETY SWITCH FAULT	
SAFETY SWITCH P12		Display message on LCD. P12 SAFETY SWITCH FAULT	
SAFETY SWITCH P14		Display message on LCD. P14 SAFETY SWITCH FAULT	
SAFETY SWITCH P18		Display message on LCD. P18 SAFETY SWITCH FAULT	
SAFETY SWITCH P22		Display message on LCD. P22 SAFETY SWITCH FAULT	
SAFETY SWITCH P22R		Display message on LCD. P22R SAFETY SWITCH FAULT	
SAFETY SWITCH P30		Display message on LCD. P30 SAFETY SWITCH FAULT	
PLATFORM OVERLOAD SENSOR	Fault check (if active)	Display message on LCD.	Power up controller with the problem corrected.
BOOM UP OVERLOAD			
BOOM DOWN OVERLOAD			
SHUT DOWN MODE			

Continued on next
page

CONTROL SYSTEM FAULT CODES

REV A

Error Source	Error Type	Effects	Recovery Actions
TURNABLE ROTATE JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
TURNABLE ROTATE BUTTONS	Fault Check, (both buttons pressed)	Turntable rotate disabled, display message on LCD.	Power up controller with the problem corrected.
TURNABLE ROTATE SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
TURNABLE ROTATE FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		
TURNTABLE ROTATE CW VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
TURNTABLE ROTATE CCW VALVE			
TURNTABLE LEVEL SENSOR X-DIRECTION	Fault check	Display message on LCD and sound audible alarm.	Correct problem.
TURNTABLE LEVEL SENSOR Y-DIRECTION			
PLATFORM LEVEL SENSOR Y-DIRECTION			

REV A

CONTROL SYSTEM FAULT CODES

Error Source	Error Type	Effects	Recovery Actions
PRIMARY BOOM ANGLE SENSOR	Value at 5.0 V	Sound audible warning and flash primary boom down LED at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR SHORTED HIGH. Primary boom up inhibited. Primary boom velocity limited to 50% of default value.	Correct problem.
	Value at 0 V	Sound audible warning and flash primary boom down LED at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR SHORTED LOW. Primary boom up inhibited. Primary boom velocity limited to 50% of default value.	Correct problem.
	Not calibrated	Sound audible warning at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR NOT CALIBRATED, inhibit primary boom up from platform control.	Calibrate primary boom angle sensor.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
PROPEL JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
PROPEL VALVES FWD PROPEL VALVES REV PROPEL EDC FWD PROPEL EDC REV	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing, (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		



Continued on next page

CONTROL SYSTEM FAULT CODES

REV A

Error Source	Error Type	Effects	Recovery Actions
MOTOR SPEED VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
BRAKE VALVE			
AUX PROPEL VALVE			
PLAT LEV UP VALVE			
PLAT LEV DN VALVE			
PLAT ROT CW VALVE			
PLAT ROT CCW VALVE			
JIB UP VALVE			
JIB DN VALVE			
JIB SWITCHES	Fault Check, (both contacts closed)	Affected functions disabled, display message on LCD.	Power up controller with the problem corrected.
PLAT ROT SWITCHES			
STEERING JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
LF STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
RF STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
LR STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
RR STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
LF STEER VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
RF STEER VALVE			
LR STEER VALVE			
RR STEER VALVE			
FOOTSWITCH TIMEOUT		Display message on LCD display.	Recycle power.

REV A

Ford Engine ECM Fault Code Chart

Code	Problem	Cause	Solution
111	Closed Loop Multiplier High (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks.	Repair wiring and/or connections OR replace sensor OR repair vacuum and exhaust leaks.
112	HO2S Open/Inactive (Bank 1)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
113	HO2S Open/Inactive S(Bank 2)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
114	Post-cat oxygen sensor open	The post cat Heated Oxygen Sensor wiring and/or connections are open or shorted OR sensor is cold, non-responsive or inactive for 60 seconds or longer.	Repair wiring and/or connections OR replace the post cat oxygen sensor.
121	Closed Loop Multiplier High (Gasoline)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks OR fuel pressure is low OR the fuel injectors need cleaning or replacing.	Repair wiring and/or connections OR replace sensor OR repair any vacuum and exhaust leaks OR test the fuel pressure OR clean or replace the fuel injectors.
122	Closed Loop Multiplier Low (Gasoline)	MAP, IAT or ECT sensors not in correct position OR wiring and/or connections for sensors open or shorted OR sensor is faulty OR one or more fuel injectors are stuck open OR there is electromagnetic interference from a faulty crankshaft and/or camshaft position sensor.	Adjust or replace sensors OR clean or repair fuel injectors.
124	Closed Loop Multiplier Low (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR fuel quality is poor OR fuel system components may be faulty.	Repair wiring and/or connections OR replace sensor OR replace fuel OR test and repair the fuel system components.
133	Gasoline cat monitor	There are exhaust leaks OR the catalyst system efficiency is below the acceptable level.	Repair exhaust leaks OR there is an emissions compliance issue. Contact Ford Power Products for assistance.
134	LPG cat monitor	There are exhaust leaks OR the catalyst system efficiency is below the acceptable level.	Repair exhaust leaks OR there is an emissions compliance issue. Contact Ford Power Products for assistance.
135	NG cat monitor	There are exhaust leaks OR the catalyst system efficiency is below the acceptable level.	Repair exhaust leaks OR there is an emissions compliance issue. Contact Ford Power Products for assistance.
141	Adaptive Lean Fault - High Limit (Gasoline)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum or exhaust leaks OR one or more fuel injectors faulty or stuck closed OR fuel quality is poor OR fuel pressure is too low.	Repair heated oxygen sensor wiring and/or connections OR replace sensor OR repair vacuum and exhaust leaks OR test the fuel pressure OR clean or replace the fuel injectors.
142	Adaptive Rich Fault - Low Limit (Gasoline)	MAP, IAT or ECT sensors not in correct position OR wiring and/or connections for sensors open or shorted OR sensor is faulty OR one or more fuel injectors are stuck closed OR there is electromagnetic interference from a faulty crankshaft and/or camshaft position sensor.	Adjust or replace sensors OR clean or repair fuel injectors.
143	Adaptive Learn High (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks OR fuel quality is poor OR fuel system components may be faulty.	Repair wiring and/or connections OR replace sensor OR repair any vacuum and exhaust leaks OR replace fuel OR test and repair the fuel system components.
111	Closed Loop Multiplier High (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks.	Repair wiring and/or connections OR replace sensor OR repair vacuum and exhaust leaks.
112	HO2S Open/Inactive (Bank 1)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
113	HO2S Open/Inactive S(Bank 2)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
114	Post-cat oxygen sensor open	The post cat Heated Oxygen Sensor wiring and/or connections are open or shorted OR sensor is cold, non-responsive or inactive for 60 seconds or longer.	Repair wiring and/or connections OR replace the post cat oxygen sensor.
121	Closed Loop Multiplier High (Gasoline)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks OR fuel pressure is low OR the fuel injectors need cleaning or replacing.	Repair wiring and/or connections OR replace sensor OR repair any vacuum and exhaust leaks OR test the fuel pressure OR clean or replace the fuel injectors.

FORD ECM FAULT CODE CHART

REV A

Code	Problem	Cause	Solution
144	Adaptive Learn Low (LPG)	Engine wire harness may have an intermittent short to 5V DC or 12V DC OR fuel system components may be faulty.	Repair short in engine wire harness OR test and repair the fuel system components.
161	System Voltage Low	Battery is faulty OR alternator is not charging OR battery supply wiring to ECM is open or shorted.	Replace battery OR repair alternator OR repair battery supply wiring to ECM.
162	System Voltage High	Alternator is overcharging the battery when engine RPM is greater than 1500 rpm.	Repair or replace the alternator.
211	IAT High Voltage	IAT sensor wiring and/or connections are open or shorted OR sensor is faulty OR engine intake air temperature is too cold.	Repair wiring and/or connections OR replace sensor OR direct warmer air into air intake.
212	IAT Low Voltage	IAT sensor wiring and/or connections are open or shorted OR sensor is faulty OR engine intake air temperature is too hot.	Repair wiring and/or connections OR replace sensor OR direct cooler air into air intake.
213	IAT Higher Than Expected (1)	Air intake temperature is greater than 200° F with the engine greater than 1000 rpm OR air intake system has leaks OR IAT sensor is faulty.	Check air intake system for damage and proper routing of air intake components OR replace the IAT sensor.
214	IAT Higher Than Expected (2)	Air intake temperature is greater than 210° F with the engine greater than 1000 rpm OR air intake system has leaks OR IAT sensor is faulty.	Check air intake system for damage and proper routing of air intake components OR replace the IAT sensor.
215	Oil Pressure Low	Faulty oil pressure sensor OR sensor wiring and/or connections open or shorted OR engine oil level too low.	Replace oil pressure sensor OR repair sensor wiring and/or connections OR fill engine oil level to specification.
221	CHT/ECT High Voltage	Engine cooling system is malfunctioning OR sensor wires and/or connections open or shorted OR sensor is faulty.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor.
222	CHT/ECT Low Voltage	Engine cooling system is malfunctioning and overheating the engine OR sensor wires and/or connections open or shorted OR sensor is faulty OR coolant level is low.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor OR fill engine coolant level to specification.
223	CHT Higher Than Expected (1)	Coolant temperature at the cylinder head is 240° F. Engine cooling system is malfunctioning and overheating the engine OR sensor wires and/or connections open or shorted OR sensor is faulty OR coolant level is low.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor OR fill engine coolant level to specification.
224	CHT Higher Than Expected (2)	Coolant temperature at the cylinder head is 250° F. Engine cooling system is malfunctioning and overheating the engine OR sensor wires and/or connections open or shorted OR sensor is faulty OR coolant level is low.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor OR fill engine coolant level to specification.
231	MAP High Pressure	Open or shorted wiring and/or connections to MAP sensor OR sensor is faulty.	Repair wiring and/or connections to sensor OR replace MAP sensor.
232	MAP Low Voltage	Open or shorted wiring and/or connections to MAP sensor OR sensor is faulty.	Repair wiring and/or connections to sensor OR replace MAP sensor.
234	BP High Pressure	MAP sensor is faulty OR ECM is faulty.	Replace MAP sensor OR replace the ECM.
235	BP Low Pressure	MAP sensor is faulty OR ECM is faulty.	Replace MAP sensor OR replace the ECM.
242	Crank Sync Noise	Crankshaft position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR sensor is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace sensor.
243	Never Crank Synced At Start	Crankshaft position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR sensor is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace sensor.

REV A

FORD ECM FAULT CODE CHART

Code	Problem	Cause	Solution
245	Camshaft Sensor Noise	Camshaft position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR sensor is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace sensor.
253	Knock Sensor Open	Knock sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections to knock sensor OR replace knock sensor.
254	Excessive Knock Signal	Knock sensor wiring and/or connections open or shorted OR there is excessive engine vibration OR sensor is faulty.	Check for excessive engine vibration OR repair wiring and/or connections to knock sensor OR replace knock sensor.
311	Injector Driver #1 Open	Open wiring and/or connections to fuel injector #1 OR fuel injector #1 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #1 OR replace fuel injector #1 OR replace the ECM.
312	Injector Driver #1 Shorted	Wiring and/or connections to fuel injector #1 shorted OR fuel injector #1 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #1 OR replace fuel injector #1 OR replace the ECM.
313	Injector Driver #2 Open	Open wiring and/or connections to fuel injector #2 OR fuel injector #2 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #2 OR replace fuel injector #2 OR replace the ECM.
314	Injector Driver #2 Shorted	Wiring and/or connections to fuel injector #2 shorted OR fuel injector #2 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #2 OR replace fuel injector #2 OR replace the ECM.
315	Injector Driver #3 Open	Open wiring and/or connections to fuel injector #3 OR fuel injector #3 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #3 OR replace fuel injector #3 OR replace the ECM.
316	Injector Driver #3 Shorted	Wiring and/or connections to fuel injector #3 shorted OR fuel injector #3 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #3 OR replace fuel injector #3 OR replace the ECM.
321	Injector Driver #4 Open	Open wiring and/or connections to fuel injector #4 OR fuel injector #4 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #4 OR replace fuel injector #4 OR replace the ECM.
322	Injector Driver #4 Shorted	Wiring and/or connections to fuel injector #4 shorted OR fuel injector #4 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #4 OR replace fuel injector #4 OR replace the ECM.
351	Fuel Pump Loop Open or High Side Short To Ground	Open wiring and/or connections to fuel pump OR fuel pump power shorted to ground OR fuel pump is faulty.	Repair wiring and/or connections to fuel pump OR replace fuel pump.
352	Fuel Pump High Side Shorted To Power	Wiring and/or connections to fuel pump shorted to power OR fuel pump is faulty.	Repair wiring and/or connections to fuel pump OR replace fuel pump.
353	MegaJector delivery pressure higher than expected	Fuel pressure too high OR LPG lockoff not sealing correctly OR the line between the MegaJector and carburetor is kinked or restricted or is leaking OR engine cooling system is not operating properly OR MegaJector is faulty.	Check fuel pressure OR repair LPG lockoff OR repair the line between the MegaJector and carburetor OR repair engine cooling system OR replace MegaJector.
354	MegaJector delivery pressure lower than expected	Fuel pressure too low OR LPG lockoff not opening completely OR the line between the MegaJector and carburetor is kinked or restricted or is leaking OR engine cooling system is not operating properly OR MegaJector is faulty.	Check fuel pressure OR repair LPG lockoff OR repair the line between the MegaJector and carburetor OR repair engine cooling system OR replace the MegaJector.
355	MegaJector communication lost	The ECM doesn't get any response from the MegaJector, or an incorrect response for 500ms period or longer.	Check CAN circuits for continuity and shorts to power or ground and for continuity and repair as necessary OR replace the MegaJector.
361	MegaJector voltage supply high	The MegaJector detects voltage greater than 18 volts for 5 seconds anytime the engine is cranking or running.	Repair charging system OR replace the MegaJector.
362	MegaJector voltage supply low	The MegaJector detects voltage less than 9.5 volts for 5 seconds anytime the engine is cranking or running.	Repair VBAT power or ground circuit to ECM and MegaJector OR replace battery OR repair charging system OR replace the MegaJector.



Continued on next page

FORD ECM FAULT CODE CHART

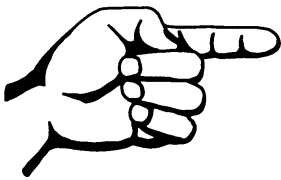
REV A

Code	Problem	Cause	Solution
363	MegaJector internal actuator fault detection	The MegaJector detects an internal fault. Open or short in power, ground or CAN circuits.s	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.
364	MegaJector internal circuitry fault detection	The MegaJector detects an internal circuitry failure. Open or short in power, ground or CAN circuits.	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.
365	MegaJector internal communication fault detection	The MegaJector detects an internal communications failure. Open or short in power, ground or CAN circuits.	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.
411	Coil Driver #1 Open	Open wiring and/or connections to ignition coil #1 OR ignition coil #1 is faulty.	Repair wiring and/or connections to ignition coil #1 OR replace ignition coil #1.
412	Coil Driver #1 Shorted	Wiring and/or connections to ignition coil #1 shorted OR ignition coil #1 is faulty.	Repair wiring and/or connections to ignition coil #1 OR replace ignition coil #1.
413	Coil Driver #2 Open	Open wiring and/or connections to ignition coil #2 OR ignition coil #2 is faulty.	Repair wiring and/or connections to ignition coil #1 OR replace ignition coil #1.
414	Coil Driver #2 Shorted	Wiring and/or connections to ignition coil #2 shorted OR ignition coil #2 is faulty.	Repair wiring and/or connections to ignition coil #2 OR replace ignition coil #2.
511	FPP1 High Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
512	FPP1 Low Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
513	FPP1 Higher than IVS Limit	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
514	FPP1 Lower than IVS Limit	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
521	FPP2 High Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
522	FPP2 Low Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
531	TPS1 (Signal Voltage) High	The #1 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #1 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #1.
532	TPS1 (Signal Voltage) Low	The #1 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #1 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #1.
533	TPS2 (Signal Voltage) High	The #2 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #2 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #2.
534	TPS2 (Signal Voltage) Low	The #2 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #2 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #2.
363	MegaJector internal actuator fault detection	The MegaJector detects an internal fault. Open or short in power, ground or CAN circuits.s	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.

REV A

FORD ECM FAULT CODE CHART

Code	Problem	Cause	Solution
535	TPS1 Higher than TPS2	The throttle position sensor wiring and/or connections for either TPS1 or TPS2 open or shorted OR there is a poor system ground connection OR one or both throttle position sensors are faulty.	Be sure engine harness wiring and connections are in place and secure OR repair wiring and/or connections to one or both TPS sensors OR replace one or both TPS sensors.
536	TPS1 Lower than TPS2	The throttle position sensor wiring and/or connections for either TPS1 or TPS2 open or shorted OR there is a poor system ground connection OR one or both throttle position sensors are faulty.	Be sure engine harness wiring and connections are in place and secure OR repair wiring and/or connections to one or both TPS sensors OR replace one or both TPS sensors.
537	Throttle Unable to Open	Governor actuator is stuck closed OR wiring and/or connections open or shorted OR governor actuator is faulty.	Repair wiring and/or connections to governor actuator OR replace the governor actuator.
538	Throttle Unable to Close	Governor actuator is stuck open OR wiring and/or connections open or shorted OR governor actuator is faulty.	Repair wiring and/or connections to governor actuator OR replace the governor actuator.
545	Governor Interlock Failure	Engine harness wiring and/or connections open or shorted OR there is a poor system ground connection OR ECM is faulty.	Repair wiring and/or connections in engine harness OR replace the ECM.
551	Max Governor Speed Override	ECM needs to be re-programmed OR throttle is sticking open OR there are air leaks between the throttle body and cylinder head.	Re-program ECM OR repair binding throttle operation OR repair any air leaks between the throttle body and cylinder head.
552	Fuel Rev Limit	ECM needs to be re-programmed OR throttle is sticking open OR there are air leaks between the throttle body and cylinder head.	Re-program ECM OR repair binding throttle operation OR repair any air leaks between the throttle body and cylinder head.
553	Spark Rev Limit	ECM needs to be re-programmed OR throttle is sticking open OR there are air leaks between the throttle body and cylinder head.	Re-program ECM OR repair binding throttle operation OR repair any air leaks between the throttle body and cylinder head.
611	COP Failure	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
612	Invalid Interrupt	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
613	A/D Loss	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
614	RTI 1 Loss	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
615	Flash Checksum Invalid	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
616	RAM Failure	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
631	External 5V DC Ref Lower than Expected	Engine harness wiring and/or connections open or shorted to ground OR there is a faulty engine sensor OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts OR locate and troubleshoot or repair faulty engine sensor OR replace ECM.
632	External 5V DC Ref Higher than Expected	Engine harness wiring and/or connections open or shorted to ground OR there is a faulty engine sensor OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts OR locate and troubleshoot or repair faulty engine sensor OR replace ECM.
655	RTI 2 Loss	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
656	RTI 3 Loss	Loose wire connections to ECM OR ECM is faulty.S	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.



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Schematics



Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section. An illustration legend precedes each group of drawings.

Electrical Schematics

⚠ WARNING

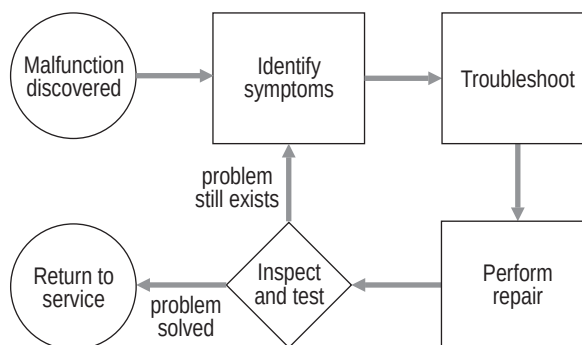
Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

Hydraulic Schematics

⚠ WARNING

Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

General Repair Process



Wire Circuit Legend

REV B

Circuit numbering

- 1 Circuit numbers consist of three parts: the circuit prefix, circuit number and circuit suffix. The circuit prefix indicates the type of circuit. The circuit number describes the function of the circuit. The circuit suffix provides an abbreviation for the number or may be used to further define the function of this portion of the circuit. It also may be used to indicate the final end of the circuit, i.e., LS or limit sw.
- 2 The circuit number may be used more than once in a circuit.

For Example:

C 74 PL – This is the circuit for the lockout valve #1. C stands for control, 74 is the number of the circuit for the primary #1 lock out valve. PL stands for Primary Lockout.

S 62 BST – This is the circuit that communicates to the onboard computers of the machine that the boom is fully stowed. S stands for safety, 62 is the number of the circuit for boom stowed and BST stands for Boom Stowed.

P 48 LP – P stands for power. 48 is the circuit number for work lamps and LP stands for Lamp.

R 48 LP – R stands for relay. In this case it is the wire that feeds the relay coil for the work lamp. All other numbers remain the same.

Circuit prefix

- C** Control
D Data
E Engine
G Gauges
N Neutral
P Power
R Relay Output
S Safety
V Valve

Circuit suffix

Definition

AC Generator
 Alternator Field
 Angle
 Auxiliary Boom Valve
 Auxiliary Forward Valve
 Auxiliary Hydraulic Pump
 Auxiliary Platform Valve
 Auxiliary Reverse Valve
 Auxiliary Steer/Drive Valve
 Axle Extend Valve
 Axle Oscillate
 Axle Retract Valve
 Axle Front Position
 Axle Rear Position
 Battery
 Boom Extended
 Boom Stowed
 Brake
 Bypass Valves
 Calibrate
 CAN Signal
 CAN Shield
 CATS Module
 Chain Break
 Data High
 Data Low
 Drive Chassis Controller
 Drive Enable
 Drive Enable Left
 Drive Enable Right
 Electrical Displacement Control
 Envelope Light
 Engine Speed Select
 Engine Status Lamp
 Envelope Lockout
 Extend/retract Lockout
 Filter Restricted
 Filter Switch
 Flashing Beacon
 Float Switch
 Footswitch Signal
 Forward
 Fuel Pump
 Fuel Select (gas/LP)
 Fuel Solenoid

Suffix

GEN
 AF
 ANG
 ABV
 AFV
 AH
 APV
 ARV
 ASV
 AXE
 AXO
 AXR
 FAP
 RAP
 BAT
 BEX
 BST
 BRK
 BV
 CAL
 CAN
 SHD
 CAT
 CNK
 DTH
 DTL
 DCN
 DE
 DEL
 DER
 EDC
 ENV
 ESP
 ESL
 ENL
 ERL
 FLR
 FLT
 FB
 FS
 FTS
 FWD
 FP
 FL
 FSL

REV B

WIRE CIRCUIT LEGEND

Definition	Suffix	Definition	Suffix
Function Enable	FE	Pressure Comp Enable	PCE
Ground Control	TCN	Pressure Sender	PSR
Ground	GND	Pressure Switches	PS
Horn	HRN	Primary Boom Angle Sensor	PBS
High RPM	HS	Primary Boom Down	PBD
Hydraulic Generator	HG	Primary Boom Ext/Ret Lockout Valve	PBL
Ignition	IGN	Primary Boom Extend	PBE
Jib Bellcrank Down	JBD	Primary Boom Extend/Retract Flow Control	PER
Jib Bellcrank Up	JBU	Primary Boom Retract	PBR
Jib Sensor	JBS	Primary Boom Angle Sensor	PBS
Jib U/D Control	JUD	Primary Boom Down	PBD
Jib Down	JD	Primary Boom Ext/Ret Lockout Valve	PBL
Jib Up/Down Flow Control	JFC	Primary Boom Extend	PBE
Jib Select Valve	JSV	Primary Boom Extend/Retract Flow Control	PER
Jib Up	JU	Primary Boom Retract	PBR
Jib E/R Control	JER	Primary Boom Up	PBU
Jib Ext	JBE	Primary Boom Up/Dwn Flow Control	PUD
Jib Ret	JBR	Primary Boom Extend/Retract Signal	PLS
Jib Rotate Left (CCW)	JRL	Primary Boom Up/Down Signal	PES
Jib Rotate Right (CW)	JRR	Primary Lockout	PL
Joystick 5 VDC Power	JPW	Primary Length Sensor	PSL
Lamps	LPS	Propel Signal	JPL
Left Front	LF	Program Setup Enable	PSE
Left Front Steer Sensor	LFS	Propel Lockout	PLL
Left Rear	LR	Proportional Valve	PRV
Left Rear Steer Sensor	LRS	Proximity Sensor	PXS
Limit Switch	LS	Receptacle	REC
Lift Speed Reduction	LSR	Recovery	RCV
Load Sensor	LDS	Retract Lockout	RL
Lockout	LO	Return	RET
Low RPM	LS	Reverse	REV
Low fuel	LOF	Right Front	RF
Motor Shift (Speed)	MS	Right Front Steer Sensor	RFS
Multi Function Valve	MFV	Right Rear	RR
Platform Control	PCN	Right Rear Steer Sensor	RRS
Primary Ext/Ret Lockout	PEL	RPM	RPM
Platform Level Down	PLD	Secondary Boom Angle Sensor	SBS
Platform Level Flow Control	PLF	Secondary Boom Elevated	SBL
Platform Level Up	PLU	Sec Boom Down	SBD
Platform Rotate Flow Control	PRF	Sec Boom Extend	SBE
Platform Rotate Control	PRC	Sec Boom Extend/Retract Flow Control	SER
Platform Rotate Left (CCW)	PRL	Sec Boom Retract	SBR
Platform Rotate Right (CW)	PRR	Sec Boom Up	SBU
Power	PWR	Sec Boom Up/Dwn Flow Control	SUD
Power to Length Sensor	PSL	Secondary Boom	SB
Platform Tilt Alarm	PTA	This list continues on the next page.	
Platform Tilt Sensor	PTS		

WIRE CIRCUIT LEGEND

REV B

Definition

Secondary Boom Lockout Valve (Extend)
 Secondary Boom Lockout Valve (Riser Down)
 Sensor
 Spare
 Speed Sensor
 Start Aid (Glow Plug or choke)
 Starter
 Steer Control Signal
 Steering Valve Clockwise
 Steering Valve Counter Clockwise
 Temp Sender
 Temp Switches
 Tether
 Tilt Alarm X axis
 Tilt Alarm Y axis
 Turntable or Ground Control Panel
 Turntable Rotate Flow Control
 Turntable Rotate Right (CW)
 Turntable Rotate Signal
 Turntable Tilt Alarm
 Turntable Tilt Sensor
 Test Switch

Suffix

SLE
 SLD
 SEN
 SP
 SS
 SA
 STR
 STC
 SCW
 SCC
 TSR
 TS
 TET
 TAX
 TAY
 TCN
 TRF
 TRR
 TRS
 TTA
 TTS
 TSW

Wire Coloring

- 1 All cylinder extension colors are solid and all retract functions are striped black. When using black wire, the stripe shall be white.
- 2 All rotations that are LEFT or CW are solid, RIGHT or CCW are striped and black. When the wire is black, the stripe is white.
- 3 All proportional valve wiring is striped.

Wire Color Legend

BL	Blue
BL/BK	Blue/Black
BL/RD	Blue/Red
BL/WH	Blue/White
BK	Black
BK/RD	Black/Red
BK/WH	Black/White
BR	Brown
GR	Green
GR/BK	Green/Black
GR/WH	Green/White
RD	Red
RD/BK	Red/Black
RD/WH	Red/White
OR	Orange
OR/BL	Orange/Blue
OR/BK	Orange/Black
OR/RD	Orange/Red
WH	White
WH/BK	White/Black
WH/RD	White/Red
YL	Yellow

REV B

WIRE CIRCUIT LEGEND

Color, Circuit #, and Primary function

RD	1	Primary boom up drive
RD/BK	2	Primary boom down drive
RD/WH	3	Primary boom up/dwn FC proportional valve drive
WH	4	Turntable rotate left valve drive
WH/BK	5	Turntable rotate right valve drive
WH/RD	6	Turntable rotate FC proportional valve drive
BK	7	Primary boom extend
BK/WH	8	Primary boom retract
BK/RD	9	Primary boom Extend/Retract proportional valve drive
BL	10	Secondary boom up valve drive
BL/BK	11	Secondary boom down valve drive
BL/WH	12	Secondary boom up/dwn FC proportional valve drive
BL/RD	13	Drive enable
OR	14	Platform level up valve
OR/BK	15	Platform level down valve
OR/RD	16	Platform up/dwn FC proportional valve drive
GR	17	Platform rotate left valve driver
GR/BK	18	Platform rotate right valve driver
GR/WH	19	Jib select valve driver circuit
RD	20	12 battery supply
WH	21	12 ignition supply
BK	22	Keyswitch power to platform ESTOP
WH	23	Power to platform
RD	24	Power to warning senders
WH/BK	25	Power to oil pressure sender
WH/RD	26	Power to temp sender
RD	27	Auxiliary power
RD/BK	28	Platform level alarm
RD/WH	29	Drive motor shift (speed)
WH	30	Forward/EDC-A

Color, Circuit #, and Primary function

WH/BK	31	Reverse/EDC-B
WH/RD	32	Brake
BK	33	Start
BK/WH	34	Start aid (glow plug or choke)
BK/RD	35	High engine speed select
BL	36	Steer clockwise
BL/BK	37	Steer counterclockwise
BL/WH	38	Gas
BL/RD	39	LP
OR	40	Limit switch signal stowed
OR/BK	41	RPM signal
OR/RD	42	Boom retracted signal
GR	43	Jib up
GR/BK	44	Jib down
GR/WH	45	AC Generator
WH	46	Drive horn
WH/BK	47	Output power enable
WH/RD	48	Work lamp
WH/BK	49	Motion lamp
BL	50	Auxiliary boom
BL/WH	51	Auxiliary steer
BL/RD	52	Auxiliary platform
WH/BK	53	Boom envelope safety valve cutoff
BK/WH	54	Power to safety interlock switches (engine)
GR/BK	55	Axle oscillation
RD	56	Foot switch/TCON estop power
RD/WH	57	Boom down safety interlock
RD/BK	58	Safety interlock to engine
GR/WH	59	Chain break circuit
GR/WH	60	Axle extend
GR	61	Axle retract
OR	62	Boom stowed (safety)
OR/RD	63	Power to boom envelope safety switch

This list continues on the next page.

WIRE CIRCUIT LEGEND

REV B

Color, Circuit #, and Primary function

OR/BK	64	Power for operational switches
BL/WH	65	Low fuel indication
BL	66	Drive enable
BL	67	Secondary boom not stowed
RD	68	Primary boom lowered (operational)
BL	69	Primary boom #1 extended
BL/WH	70	Primary boom #2 retracted
BL/BK	71	Primary boom #2 extended
GN	72	Secondary boom extend
GN/BK	73	Secondary boom retract
RD	74	Primary #1 Lockout
RD/WH	75	Primary #2 Lockout
BL	76	Pri boom #3 extended
WH	77	Lower angle #1 operational
WH/BK	78	Upper angle #2 operational
BK	79	power from TCON ESTOP
N/A	80	Can 2.0/J1939 Shield
GR	81	Can 2.0/J1939 Low
YL	82	Can 2.0/J1939 High
GR/WH	83	Tilt signal x axis
GR/BK	84	Tilt signal y axis
GR	85	Tilt sensor power
OR	86	Hydraulic filter restricted
RD	87	Platform level safety power
RD/BK	88	Platform level safety output
BR	89	Platform level safety ground
RD/BK	90	Proximity kill
RD/WH	91	Gate Interlock
WH/BK	92	Motor speed (LO/HI)
WH/RD	93	Motor bypass
WH	94	Load sensor
OR	95	Tether ESTOP return
RD	96	Tether power
BK	97	Tether ESTOP power
WH	98	J1708 + (high)

Color, Circuit #, and Primary function

BK	99	J1708 - (low)
WH/RD	100	Outrigger lowered
WH/BK	101	Outrigger raised
OR	102	Pothole protector up
OR/RD	103	Pothole protector down
BK/WH	104	Proprietary data buss – (i.e. ITT or AP)
BK/RD	105	Proprietary data buss + (i.e. ITT or AP)
GR	106	Spare
RD	107	Alternator field
BL/WH	108	Engine status
GR/WH	109	Sensor pwr
BK	110	Sensor return
OR	111	Steer signal
RD	112	Steer signal to solenoid valve
OR/RD	113	Multi function valve
BK/RD	114	Load moment overweight
RD/BK	115	Load moment underweight
OR	116	Hydraulic oil cooler
RD	117	Flashing beacon
OR	118	Lift speed reduction
BL	119	Hydraulic pressure sensor output
OR	120	Oil cooler fan
GR	121	Axle oscillate LEFT
GR/BK	122	Axle oscillate RIGHT
RD/BK	123	Primary boom angle signal operational
RD/WH	124	Secondary boom angle signal operational
WH/RD	125	Secondary boomlockout (Ext Enable)
WH/BK	126	Secondary boom lockout (Riser Down Enable)
GR	127	ECU test switch
OR/RD	128	Low engine speed

REV B

WIRE CIRCUIT LEGEND

Color, Circuit #, and Primary function

RD/BK	129	Descent alarm
WH/RD	130	Travel alarm
BL	131	Motion alarm
GR	132	Platform load input
GR/WH	133	Platform load alarm
GR/BK	134	Key switch power
BL/WH	135	Fuel pump
RD	136	Power to safety module
RD/WH	137	Propel power (P_38)
RD/BK	138	Pri boom up/sec boom dwn-Ext (P_11/30)
WH/RD	139	Turntable rot FC safety (P_39)
OR/RD	140	Boom envelope safety
RD	141	Primary boom angle signal safety
OR	142	Secondary boom angle signal safety
BL/RD	143	Drive enable left
BL/WH	144	Drive enable right
RD/WH	145	Calibrate
BL	146	Jib bellcrank up FC
BL/BK	147	Jib bellcrank down FC
BL/WH	148	Jib bellcrank sensor
GR/WH	149	Jib Up/Down FC
GR/BK	150	Hydraulic generator bypass
GR	151	Hydraulic EDCoutput
BK	152	Injector retard
BK	153	Jib extend
BK/WH	154	Jib retract
OR/RD	155	Pressure comp enable
GN/WH	156	Jib Up/Down
BK/RD	157	Jib Ext/Ret
BL/RD	158	Spare
BL/WH	159	Steer joystick signal
WH/RD	160	Propel joystick signal
WH/BK	161	Sec boom joystick signal
OR	162	Joystick 5 VDC power

Color, Circuit #, and Primary function

BL/WH	163	Pri extend/retract signal
RD/WH	164	Pri up/down signal
WH/RD	165	TT Rotate signal
OR	166	Boom length signal safety
OR/BK	167	Boom length signal operational
BL/RD	168	Primary boom hydraulic valve lockout
GN	169	Envelope active LED
WH/RD	170	Load sense relay source
WH/BK	171	Load sense relay sink
BL	172	UP/DN flow control ground
BK	173	Ext/Ret flow control ground
WH	174	Key switch power, ground position
WH/BK	175	Load sensor signal operational
GN/WH	176	Secondary extend/retract FC
BL/RD	177	Extend/retract lockout
BK	178	Control module status light
GN	179	Drive power relay
BK	180	Lift power relay
OR	181	48 Volt alternator field (or battery)
RD	182	24 Volt battery
BL	183	Envelope or load sense recovery
WH	184	Program setup enable
WH	185	Encode A
BL	186	Encode B
BL	187	Bootstrap or program enable
GR	188	Safety cross check
BK	189	Data receive
BK/WH	190	Data transmit
WH/RD	191	Multi-Function pressure relief
WH/BK	192	Jib rotate left
WH/RD	193	Jib rotate right
WH/RD	194	Speed select input
OR/RD	195	Electric brake source
YL	196	2.5V Sensor power
BR	N/A	Ground or return

Limit Switches and Angle Sensors

REV B

Types of Limit Switches

There are two types of limit switches, found in various locations throughout the machine: mechanical-type **operational** or **safety** switches. As in aircraft, which features redundant safety systems, each mechanical operational switch is backed up with a separate, independently functioning safety switch.

The mechanical-type **operational** or **safety** switches are used to sense a positive displacement or movement of the limit switch actuator, or arm, as the machine moves through its range of operational functions. Included in this group are envelope limit switches which sense the extended length and angle of the booms and rotational position of the turntable.

For example, when the secondary boom is fully raised and the operational switch is activated, it tells the ECM at the ground controls to start extending the secondary boom.

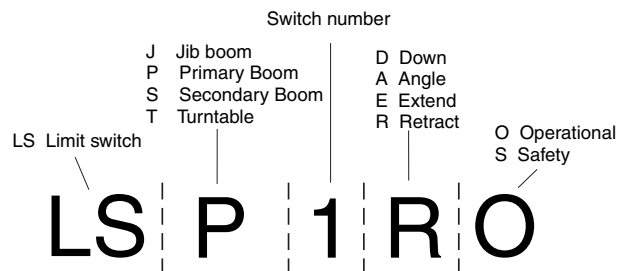
Another example is the drive enable limit switch, which disables the drive function anytime the boom is rotated past the rear axles, indicated by the 'circle' end of the drive chassis.

In some cases, the engine will be stopped if safety parameters are exceeded.

Limit Switch Numbering

LSP1AO	Primary boom angle stowed
LSP1RO	Primary boom length retracted
LSP1EO	Primary boom length fully extended
LSS1AO	Secondary boom angle, fully stowed
LSS2AO	Secondary boom angle, fully raised
LSS3AO	Secondary boom angle, 25° to 30°
LSS2AS	Secondary boom angle safety
LSS1RO	Secondary boom fully retracted
LSS1RS	Secondary boom fully retracted, safety
LSJ1EO	Platform level fully extended
LST1O	Drive enable mechanical
LSA1OS	Oscillate axle, right side
LSA2OS	Oscillate axle, left side

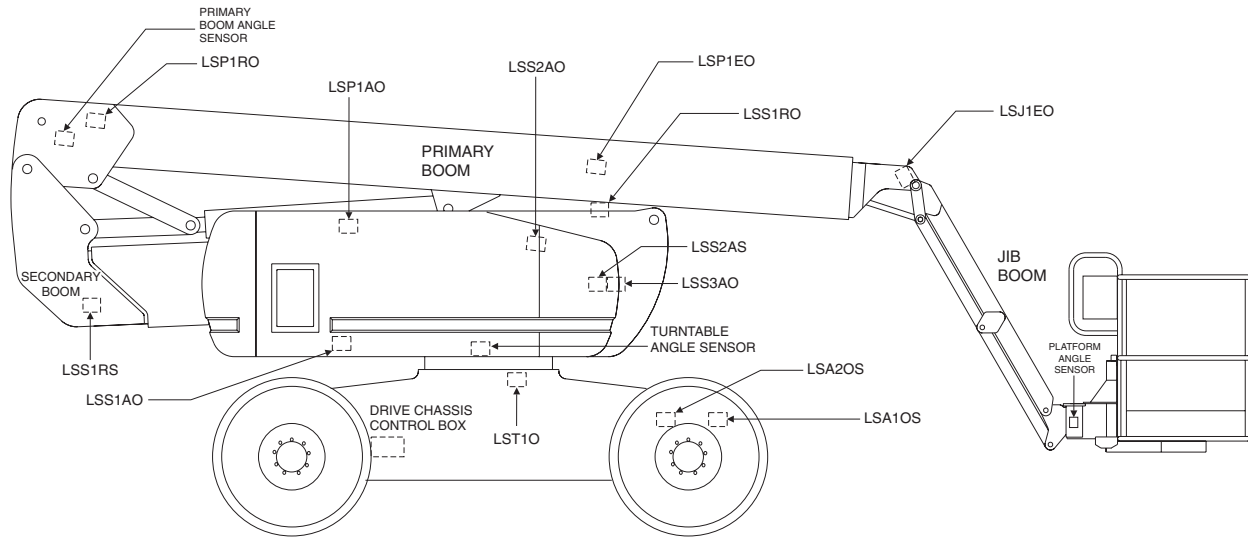
Numbering Legend



REV B

LIMIT SWITCHES AND ANGLE SENSORS

Limit Switch and Angle Sensor Legend



LSA1OS: Limit switch, Axle #1 Oscillating Operational. Activates the axle oscillate circuit on the right side.

LSA2OS: Limit switch, Axle #2 Oscillating Operational. Activates the axle oscillate circuit on the left side.

LST1O: Limit switch, Operational. Activates the drive enable zone.

Turntable Angle Sensor: Measures the X axis and Y axis of the turntable. The alarm sounds at 4.5 degrees.

Primary Boom Angle Sensor (PBS): Measures the Y axis angle of the primary boom. The operational range shall be +33 degrees to +73 degrees. The safety cutouts are set at +70 degrees and will disable boom up and stop the engine.

Platform Angle Sensor: Measures the angle of the platform. The range of measurement is +/- 20 degrees. The safety cutout is set at +/- 10 degrees from gravity and will disable the primary and secondary boom up/down functions and the platform level up/down functions.

LSS2AO: Limit switch, Secondary Boom #2 Angle Operational Switch. Secondary boom angle full extension, angle up all the way (secondary boom extend allowed).

LSS3AO: Limit switch, Secondary Boom #3 Angle Operational Switch. Secondary boom elevated to 30-35 degrees. Used to switch platform/primary boom leveling parameters.

LSS2AS: Limit switch, Secondary Boom #2 Angle Safety Switch. Secondary boom angle full extension, angle up all the way (secondary boom extend allowed). Backup switch for LSS2AO.

LSS1RO: Limit switch, Secondary Boom #1 Retract Operational Switch. Secondary boom fully retracted (secondary boom down allowed).

LSS1RS: Limit switch, Secondary Boom #1 Retract Safety Switch. Secondary boom fully retracted (secondary boom down allowed). Backup switch for LSS1RO.

LSS1AO: Limit switch, Secondary Boom #1 Angle Operational Switch. Open when the secondary boom is fully lowered, closes when the boom is raised out of the stowed position. This switch limits the drive speed and disables the drive motor destroke. The other contacts close when the boom is fully lowered allowing the platform to be tucked underneath the mast for transport.

LSP1AO: Limit Switch, Primary Boom #1 Angle Operational. One side closes when the primary boom is raised from the stowed position, disabling the drive motor destroke and limiting the drive speed. The other side of the switch closes when the boom is fully lowered allowing the platform to be tucked underneath the mast for transport.

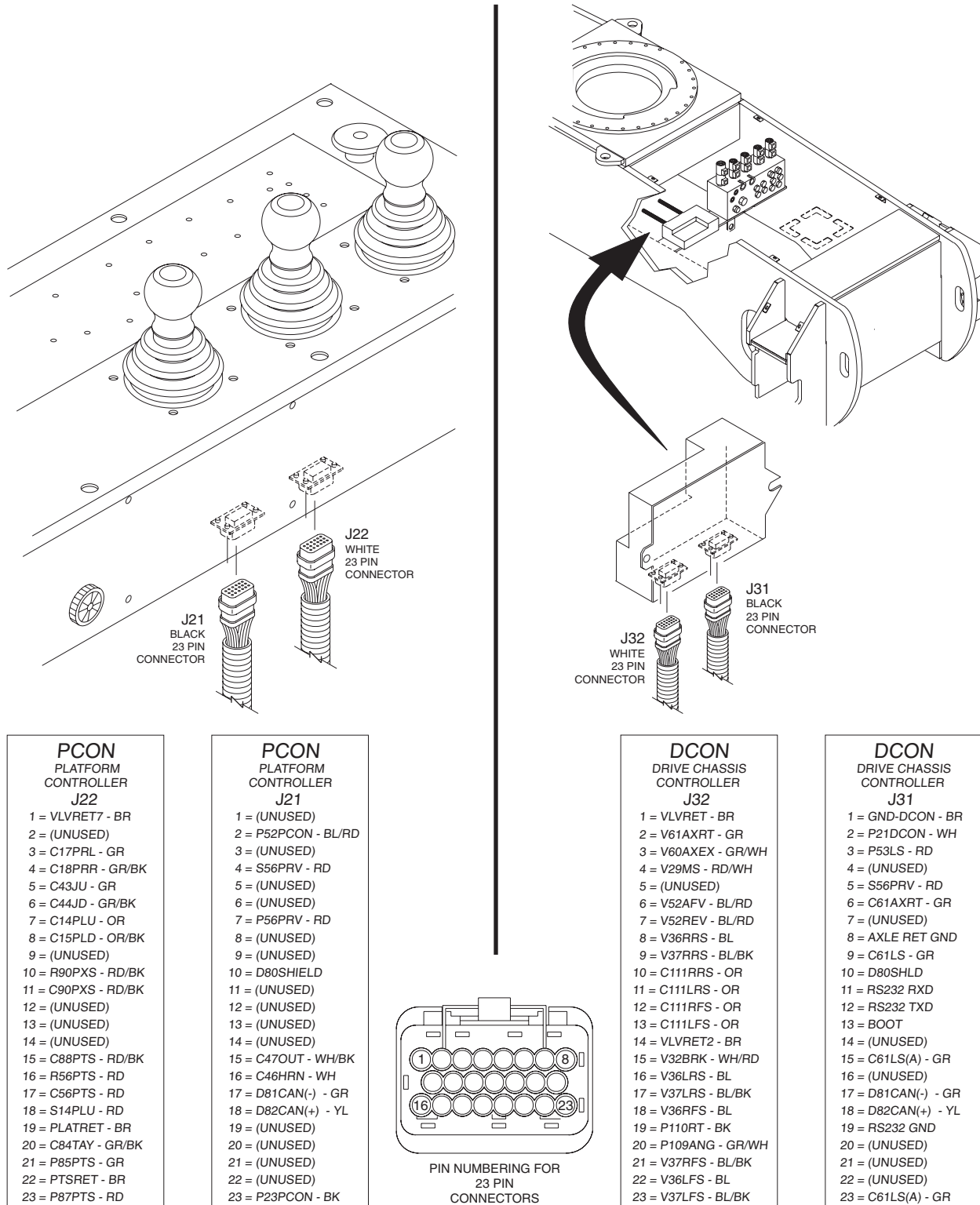
LSJ1EO: Limit Switch, Jib Boom #1. Closes when the platform leveling cylinder is fully extended, disabling the primary boom down function.

LSP1EO: Limit Switch, Primary Boom #1 Extend Operational. Switch closes as the primary boom extends the last 6 to 12 inches signaling the computer.

LSP1RO: Limit Switch, Primary Boom #1 Retract Operational. Switch closes when the primary boom is fully retracted.

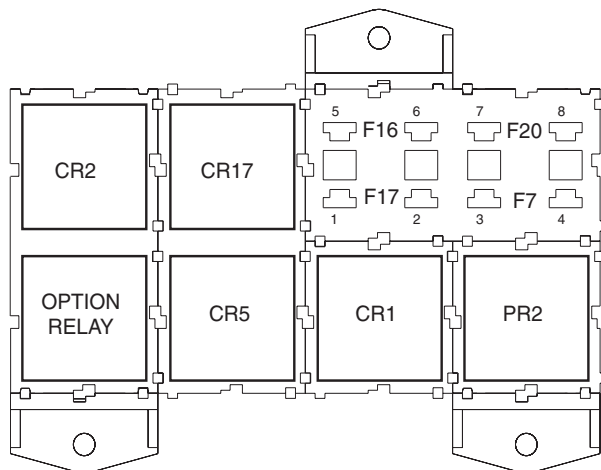
Drive Chassis and Platform Controller Pin Legend

REV B



Engine Relay and Fuse Panel Legend

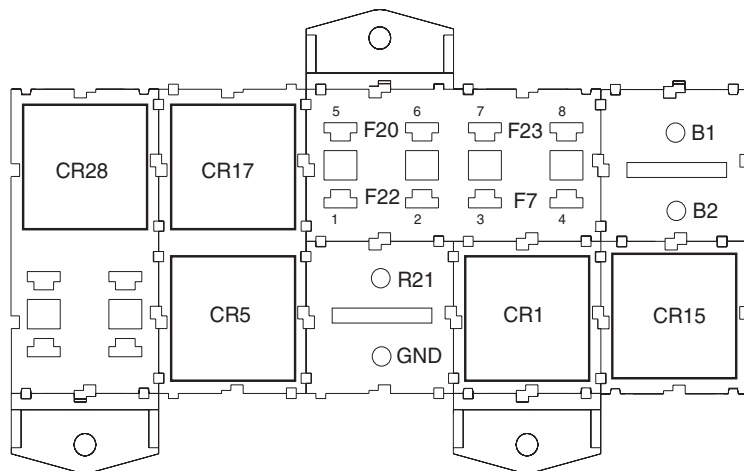
REV B



DEUTZ F4L 913

(before serial number 339)

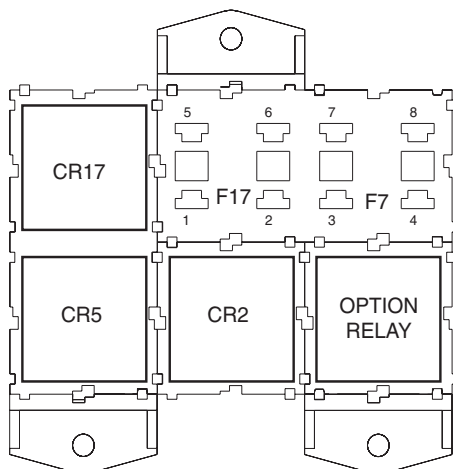
LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61225
CR2	IGNITION/FUEL RELAY	34052
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F16	FUSE, 70A, ENGINE RPM AND COLD START	88151
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536
F20	FUSE, 20A, ENGINE RPM	60536
PR2	STARTING AID RELAY	61225



DEUTZ BF4L-2011

(after serial number 338)

LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61225
CR28	ENGINE RUN/ALTERNATOR FIELD RELAY	34052
CR5	HORN RELAY	34052
CR15	GLOW PLUG RELAY	61225
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F20	FUSE, 20A, ENGINE RPM	60536
F22	FUSE, 60A, GLOW PLUG	101340
F23	FUSE, 30A, ENGINE	94327



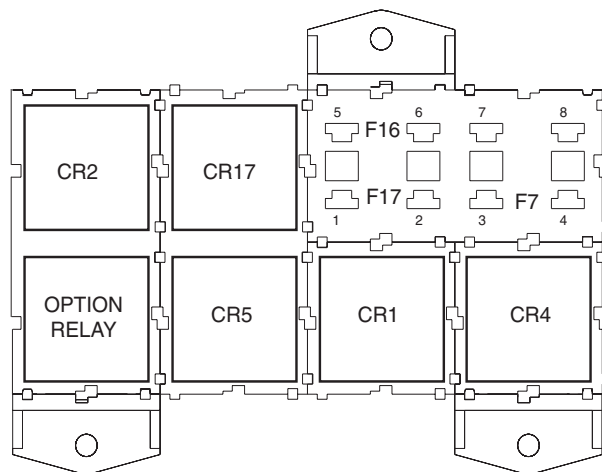
GM 3.0L

LABEL	DESCRIPTION	GENIE P/N
CR2	IGNITION/FUEL RELAY	34052
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536

Genie
A TEREX COMPANY

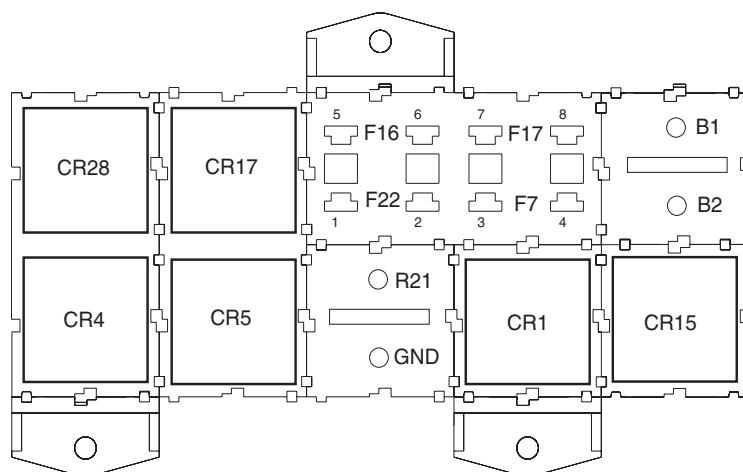
Engine Relay and Fuse Panel Legend

REV B



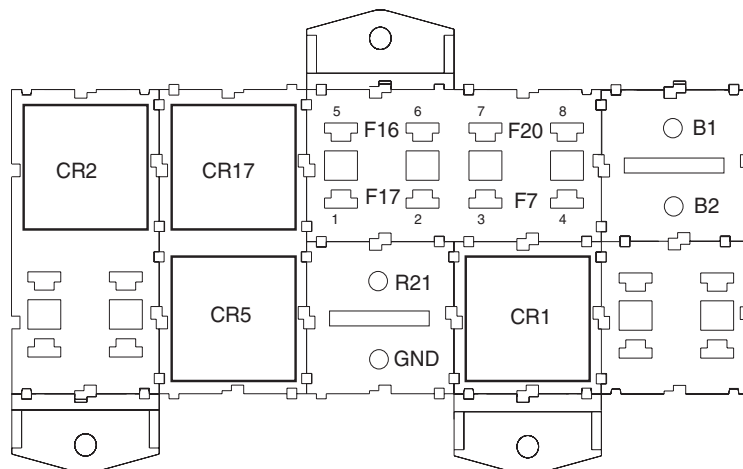
PERKINS 704-30 (before serial number 329)

LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	34052
CR2	IGNITION/FUEL RELAY	34052
CR4	RPM RELAY	34052
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F16	FUSE, 20A, ENGINE RPM AND COLD START	60536
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536



PERKINS 804C-33 (after serial number 328)

LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61225
CR2	IGNITION POWER RELAY	34052
CR5	HORN RELAY	34052
CR15	GLOW PLUG RELAY	61225
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
CR4	RPM RELAY	34052
F17	FUSE, 20A, ENGINE	60536
F7	FUSE, 30A, OIL COOLER, RPM	94327
F16	FUSE, 20A, STARTER	60536
F22	FUSE, 70A, GLOW PLUG	88151

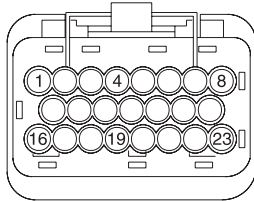


FORD LRG 425

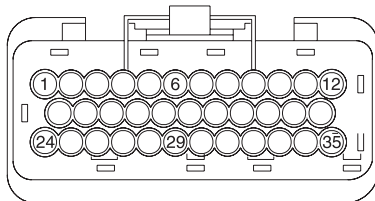
LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61255
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
CR4	RPM RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER	60536
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536

Turntable Controller Pin Legend

REV B



PIN NUMBERING FOR
23 PIN
CONNECTORS

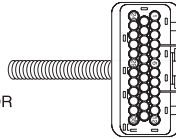


PIN NUMBERING FOR
35 PIN
CONNECTORS

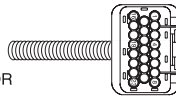


PIN NUMBERING FOR
4 PIN
CONNECTOR

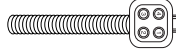
J14
WHITE
35 PIN
CONNECTOR



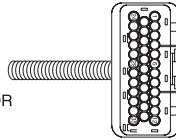
J13
WHITE
23 PIN
CONNECTOR



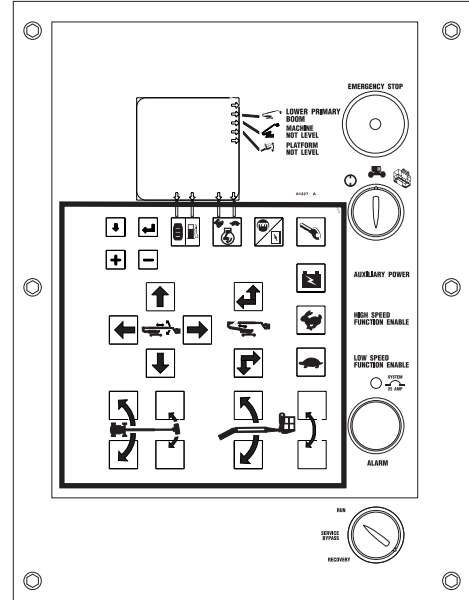
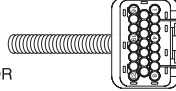
J15
4 PIN
CONNECTOR



J12
BLACK
35 PIN
CONNECTOR



J11
BLACK
23 PIN
CONNECTOR



TCON TURNTABLE CONTROLLER J11

- 1 = GNDDCON - BR
- 2 = P52PCON - BL/RD
- 3 = C46HN - WH
- 4 = C47OUT - WH/BK
- 5 = P23PCON - BK
- 6 = S56PRV - RD
- 7 = P56PRV - RD
- 8 = R48LP - WH/RD
- 9 = R49LP - WH/BK
- 10 = D80-SHIELD
- 11 = (UNUSED)
- 12 = (UNUSED)
- 13 = (UNUSED)
- 14 = CAL FREQ 1
- 15 = P97TET - BK
- 16 = CAL FREQ 2
- 17 = D81CAN(-) - GR
- 18 = D82CAN(+) - YL
- 19 = (UNUSED)
- 20 = TETFUNC - WH
- 21 = TETGND - BR
- 22 = P96TET - RD
- 23 = P95TET - OR

TCON TURNTABLE CONTROLLER J12

- 1 = GNDDCON - BR
- 2 = P21DCON - RD
- 3 = P53LS - WH/BK
- 4 = P54ENG - BK/WH
- 5 = S56PRV - RD
- 6 = P21DCON - RD
- 7 = P58LS - RD/BK
- 8 = S59SBE - GR/WH
- 9 = S121PBU - GR
- 10 = P53LS - WH/BK
- 11 = P53LS - WH/BK
- 12 = S59SBE - GR/WH
- 13 = C64LS - OR/BL
- 14 = C65LOF - BL/WH
- 15 = C66DREN - BL
- 16 = C73SBR - BL/RD
- 17 = C68PBD - RD
- 18 = C64LS - OR/BL
- 19 = C70PBR - BL/WH
- 20 = C71PBE - BL/BK
- 21 = C67SBD - BL
- 22 = C77SBU - WH
- 23 = V74PRLO - RD
- 24 = V75PRLO - RD/WH
- 25 = SNSR GND - BR
- 26 = BOOM ANGLE PWR
- 27 = G119SR - BL
- 28 = C124SBL - RD/BK
- 29 = C77AS - WH
- 30 = C78PS - WH/BK
- 31 = P56PRV - RD
- 32 = PRIMARY ANGLE SENSOR INPUT
- 33 = SEC. ANGLE SENSOR INPUT
- 34 = P30
- 35 = VLVRET1 - BR

TCON TURNTABLE CONTROLLER J13

- 1 = VLVRET1 - BR
- 2 = C35RPM - BK/RD
- 3 = C21IGN - WH
- 4 = C34SA - BK/WH
- 5 = V30FWD - WH
- 6 = V31REV - WH/BK
- 7 = C46HN - WH
- 8 = C39LP - BL/RD
- 9 = C33STR - BK
- 10 = C30EDC - WH
- 11 = C31EDC - WH/BK
- 12 = C25PSR - WH/BK
- 13 = C26TSR - WH/RD
- 14 = RET85TTSR - GR
- 15 = P85TTSR - GR
- 16 = VLVRET2 - BR
- 17 = (UNUSED)
- 18 = C41RPM - OR/BK
- 19 = (UNUSED)
- 20 = C83TAX - GR/WH
- 21 = C84TAY - GR/BK
- 22 = C45GEN - GR/WH
- 23 = VLVRET3 - BR

TCON TURNTABLE CONTROLLER J15

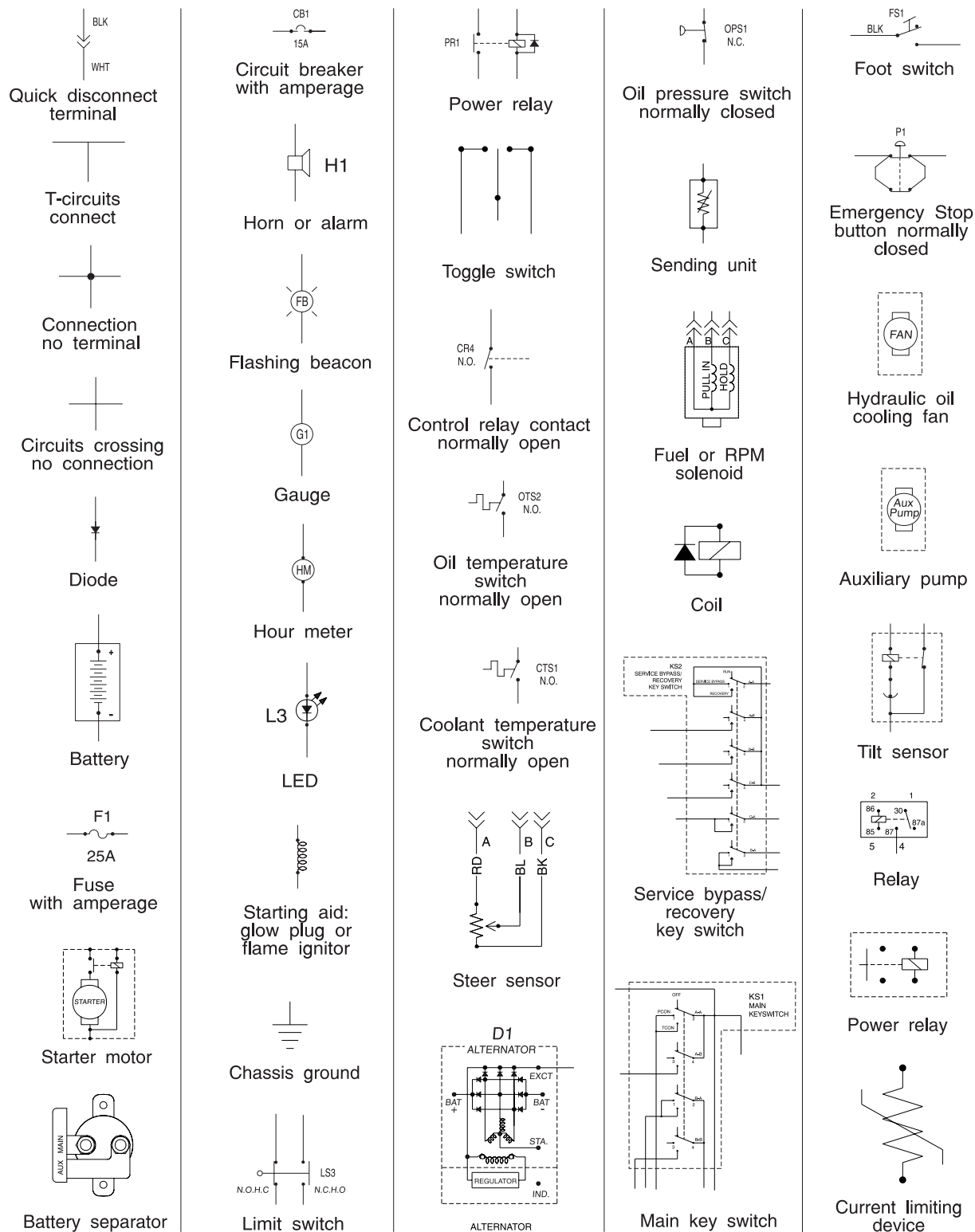
- 1 = BATVLV - RD
- 2 = BATGND - BR
- 3 = BATGND - BR
- 4 = BATECU - RD

TCON TURNTABLE CONTROLLER J14

- 1 = VLVRET4 - BR
- 2 = C03PBF - RD/WH
- 3 = C09PERF - BK/RD
- 4 = C06TRF - WH/RD
- 5 = C12FBFC - BL/WH
- 6 = C72SBE - BL/WH
- 7 = C01PBU - RD
- 8 = C02PBD - RD/BK
- 9 = C07PBE - BK
- 10 = C08PBR - BK/WH
- 11 = (UNUSED)
- 12 = C115SD - BL/BK
- 13 = R49LP - WH/BK
- 14 = VLVRET5 - BR
- 15 = (UNUSED)
- 16 = (UNUSED)
- 17 = C115LS - RD/BK
- 18 = C114LS - BK/RD
- 19 = C10SBU - BL
- 20 = C73SBR - BL/RD
- 21 = C72SBE - BL/WH
- 22 = (UNUSED)
- 23 = C113MFV - OR/RD
- 24 = (UNUSED)
- 25 = C04TRL - WH
- 26 = C05TRR - WH/BK
- 27 = VLVRTN7 - BR
- 28 = (UNUSED)
- 29 = (UNUSED)
- 30 = VLVRET6 - BR
- 31 = (UNUSED)
- 32 = C27AUX - RD
- 33 = P125SBL - WH/RD
- 34 = P126SBLD - WH/BK
- 35 = (UNUSED)

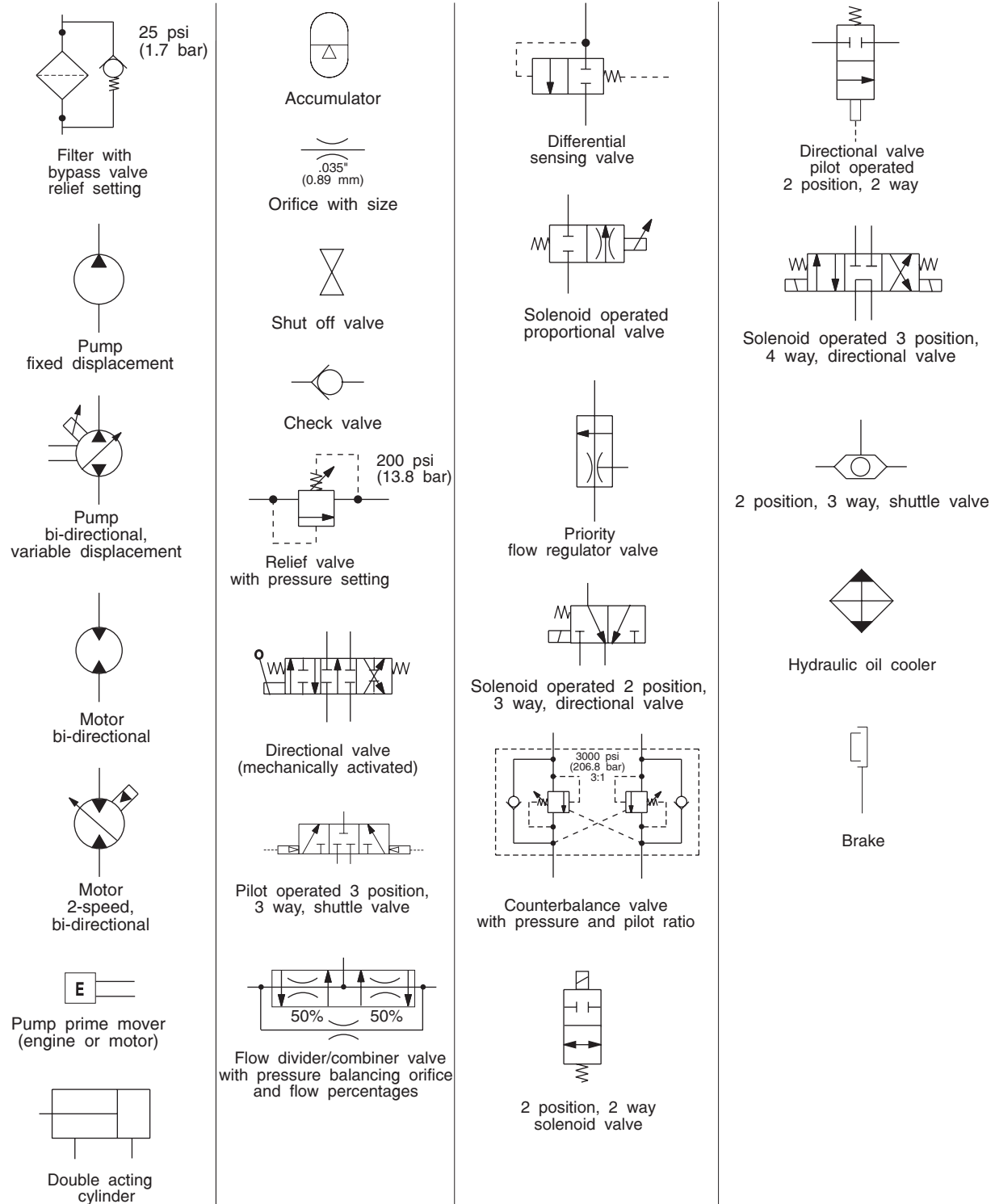
Electrical Symbols Legend

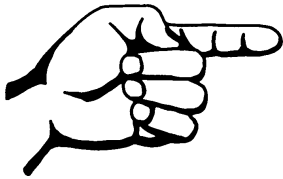
REV B



Hydraulic Symbols Legend

REV B

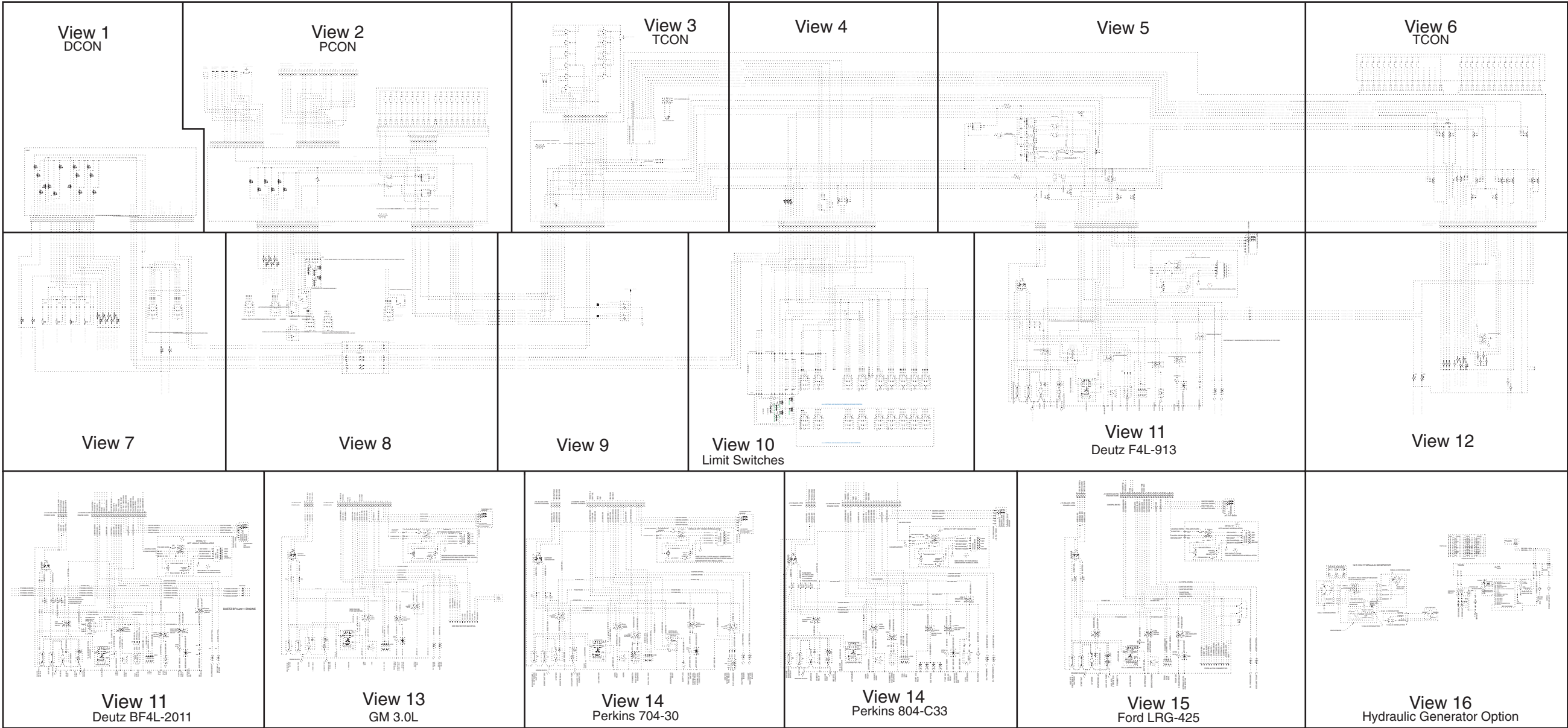




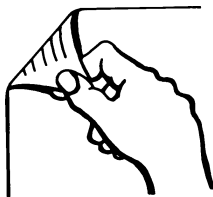
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REV C

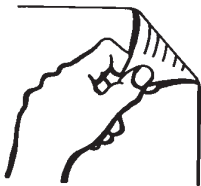
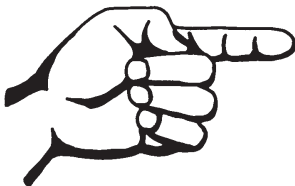
Electrical Schematic Legend



Electrical Schematic Layout



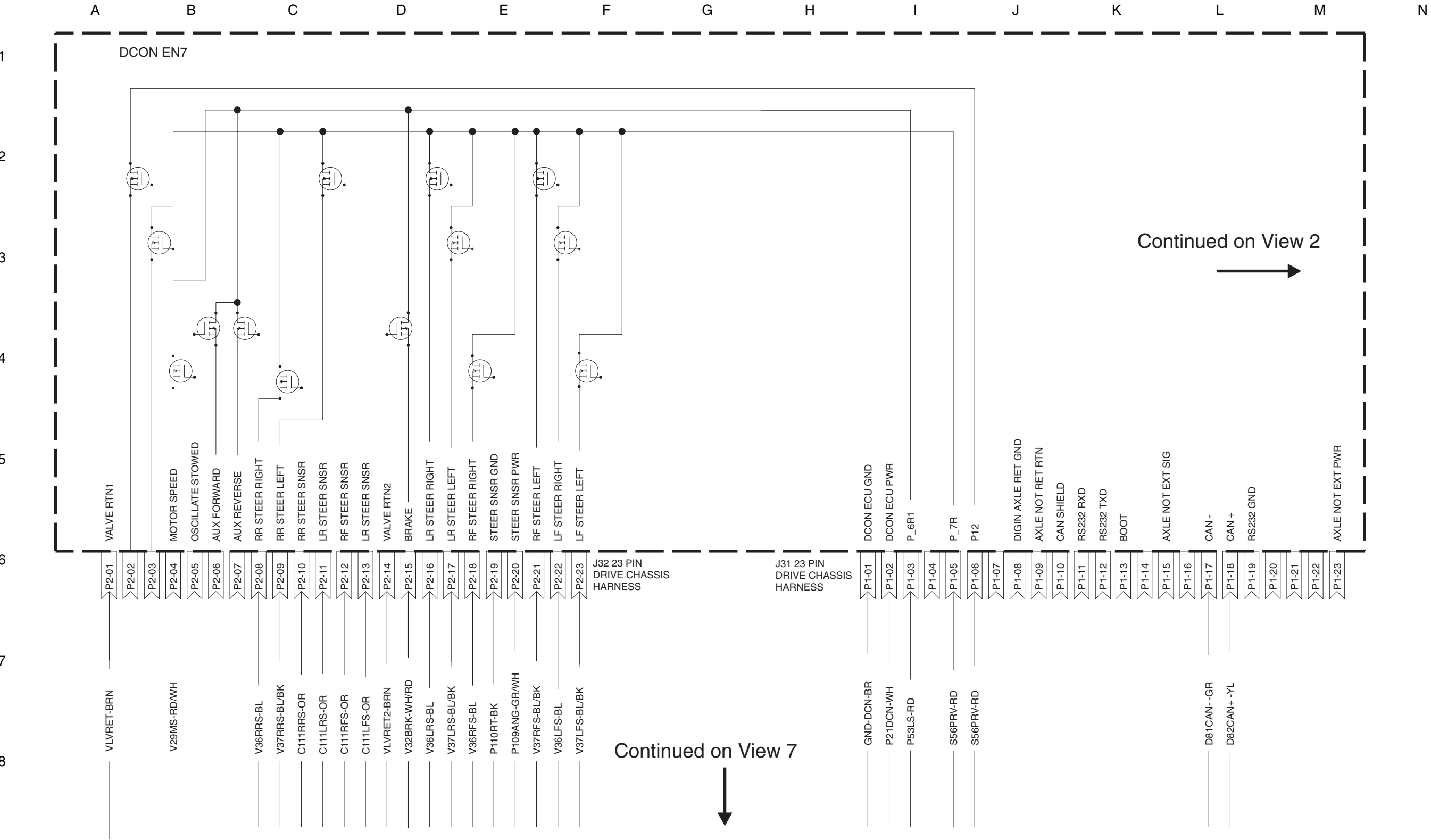
Electrical Schematic - View 1
Drive Chassis Controller (DCON)



Electrical Schematic - View 1

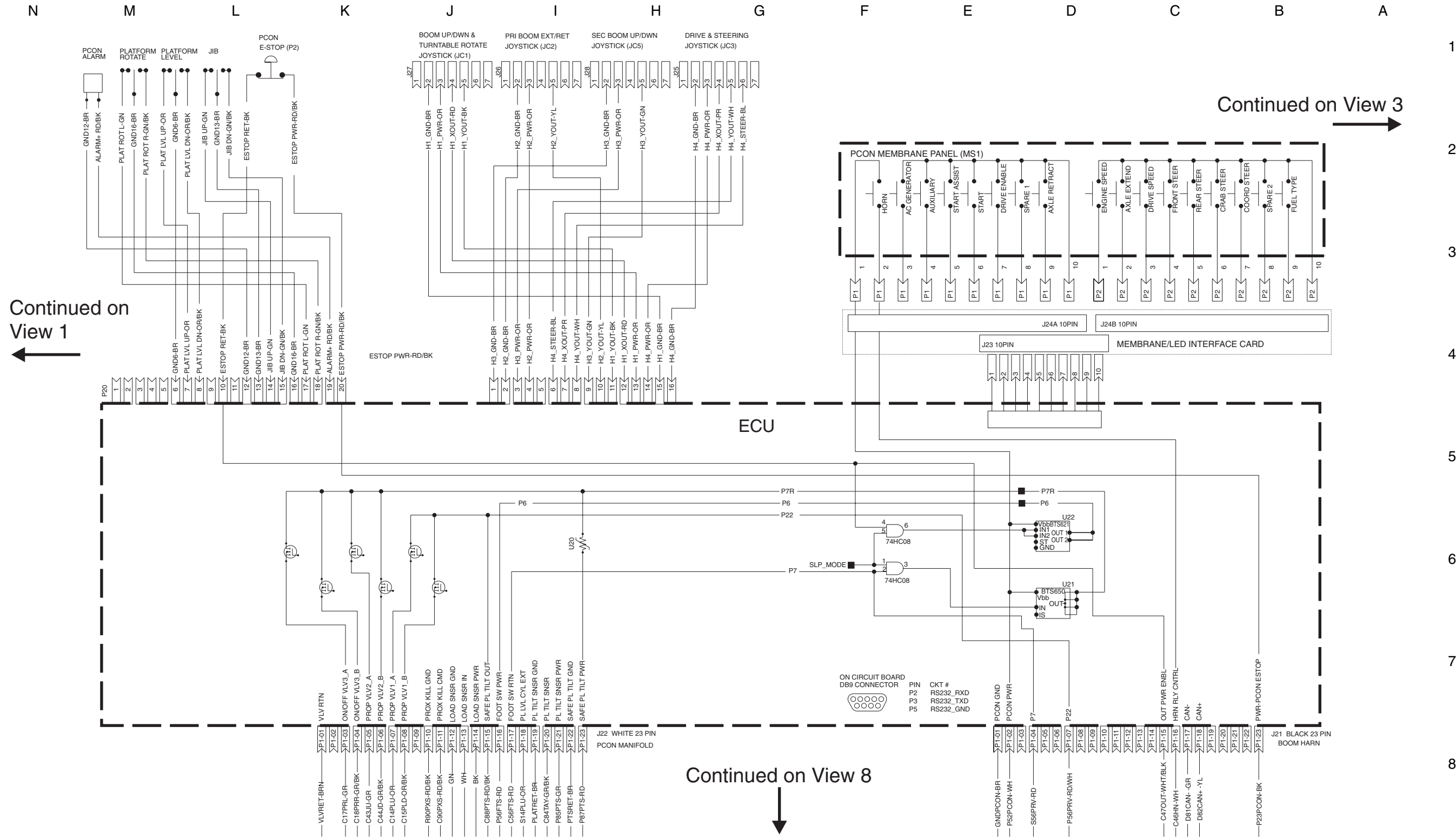
Drive Chassis Controller (DCON)

REV C



REV C

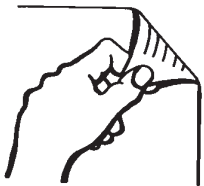
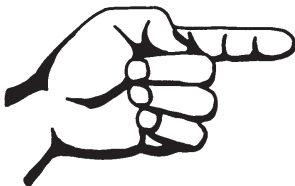
Electrical Schematic - View 2
Platform Controls (PCON)

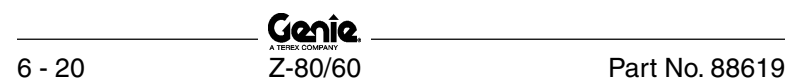


Electrical Schematic - View 2
Platform Controls (PCON)



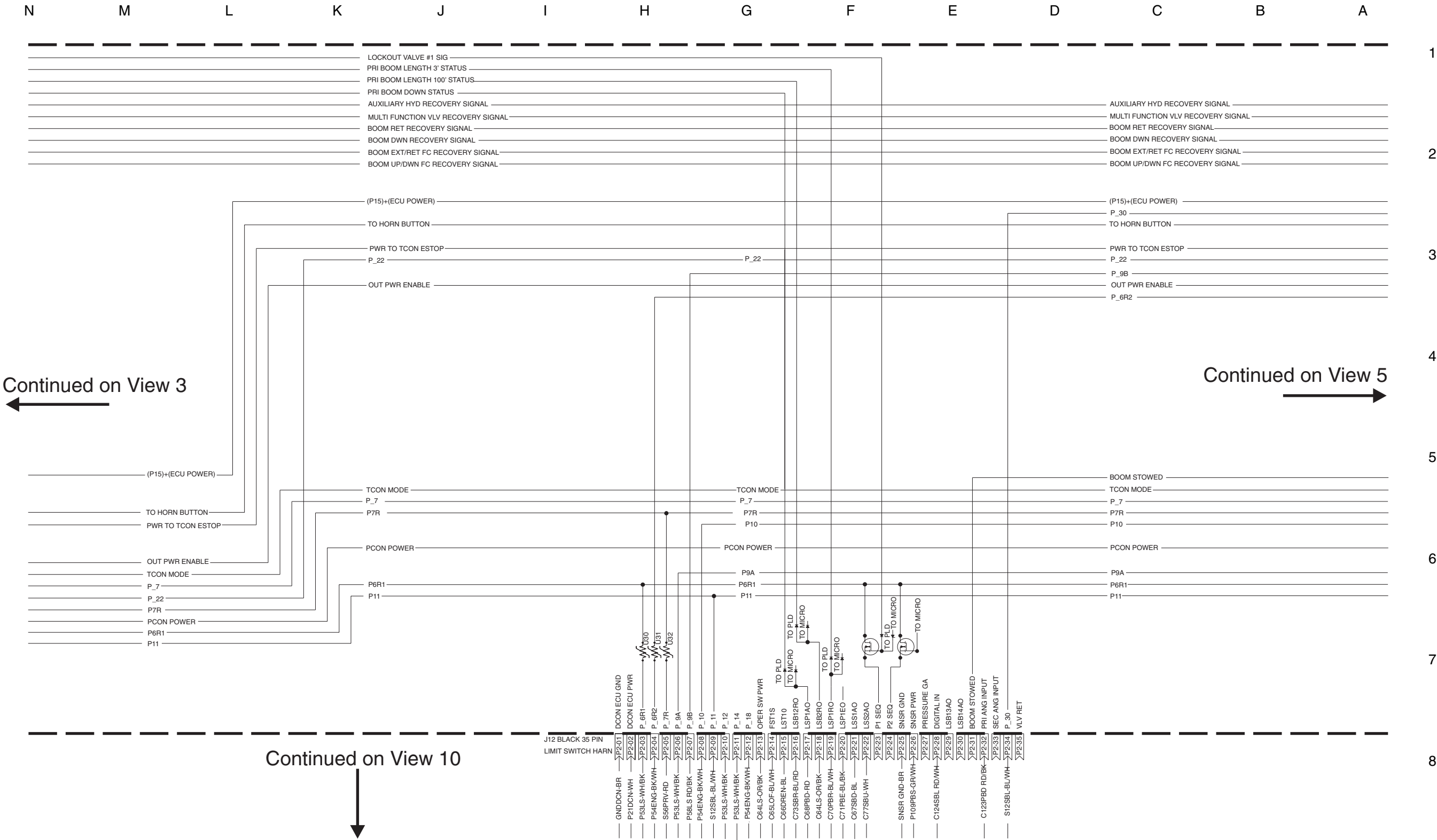
Electrical Schematic - View 3
Ground Controls (TCON)





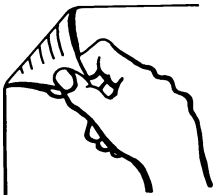
REV C

Electrical Schematic - View 4

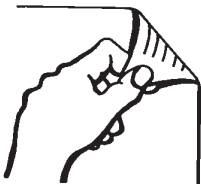
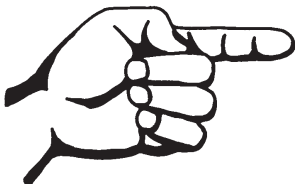




Electrical Schematic - View 4



Electrical Schematic - View 5



REV C



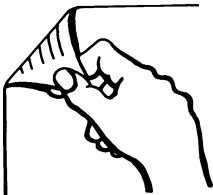
Electrical Schematic - View 6

Ground Controls (TCON)

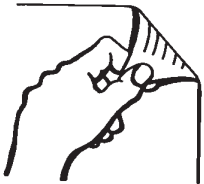
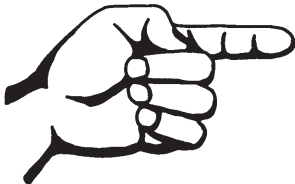
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Electrical Schematic - View 6
Ground Controls (TCON)

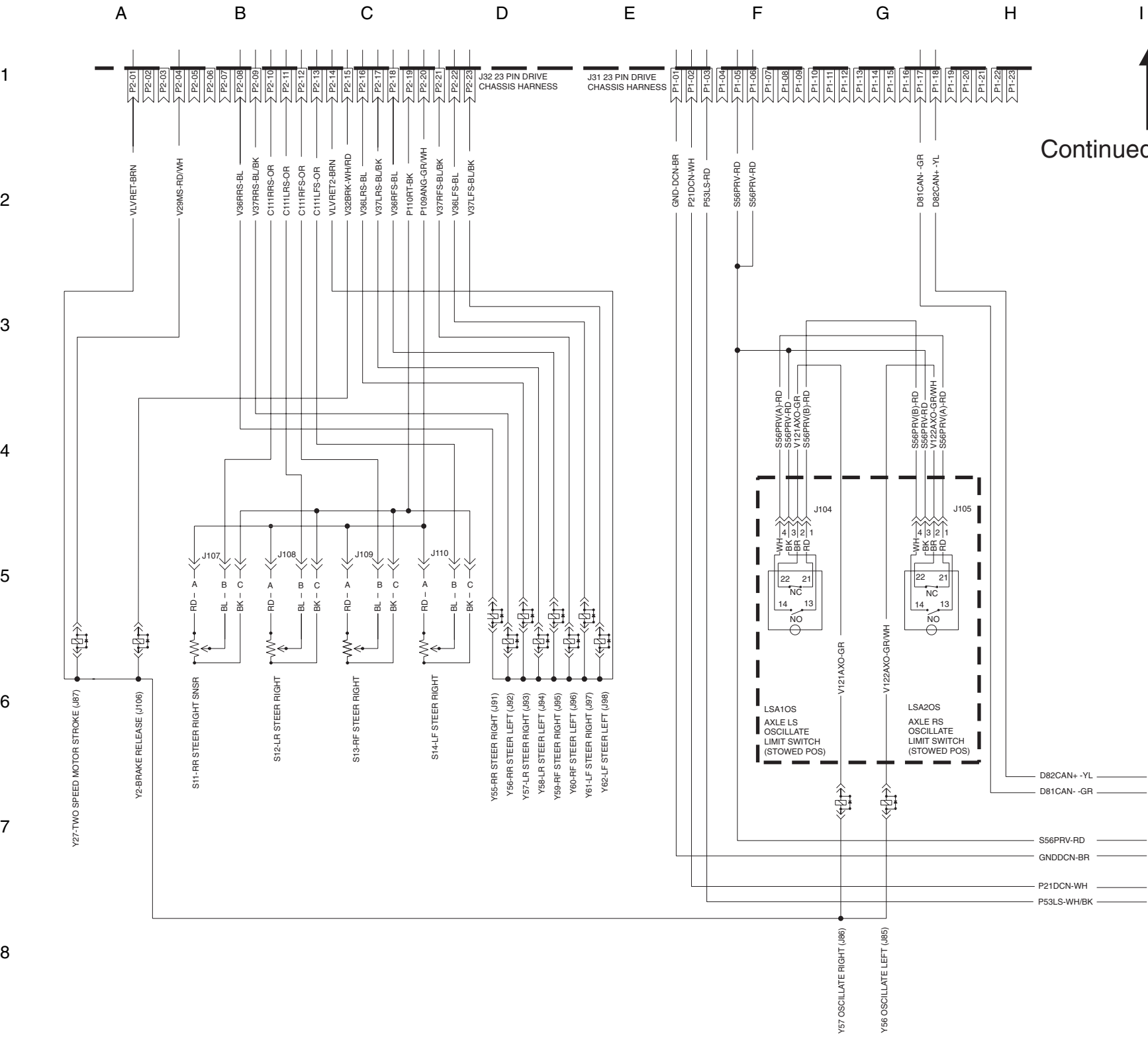


Electrical Schematic - View 7



Electrical Schematic - View 7

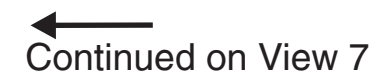
REV C



Continued on View1

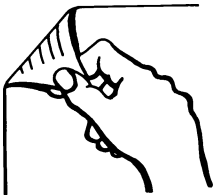
Continued on View 8

Electrical Schematic - View 8

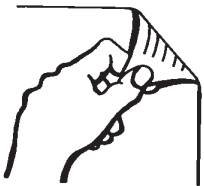
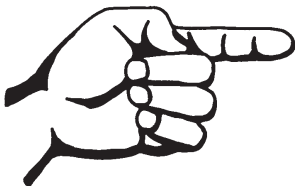




Electrical Schematic - View 8

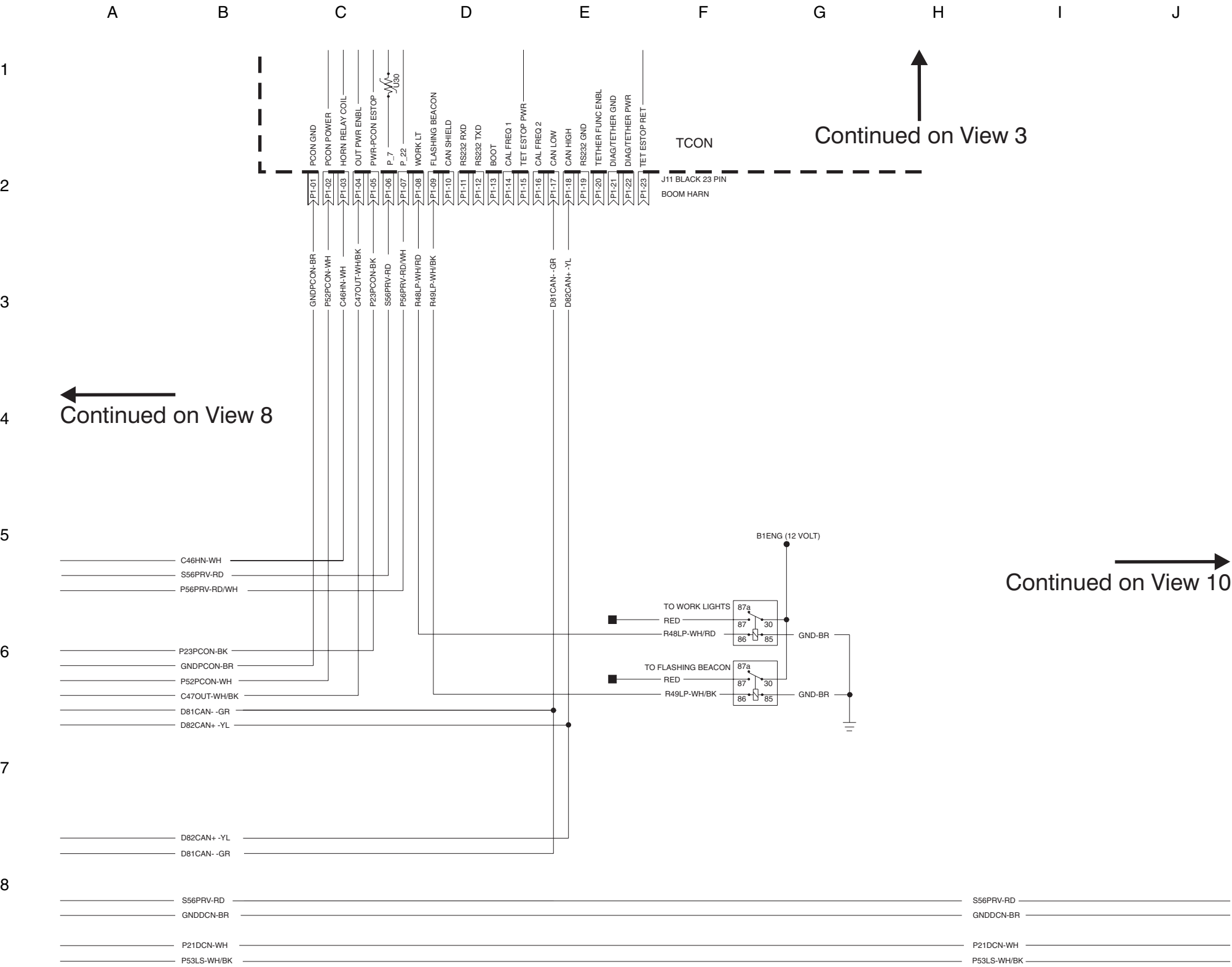


Electrical Schematic - View 9



Electrical Schematic - View 9

REV C



REV C

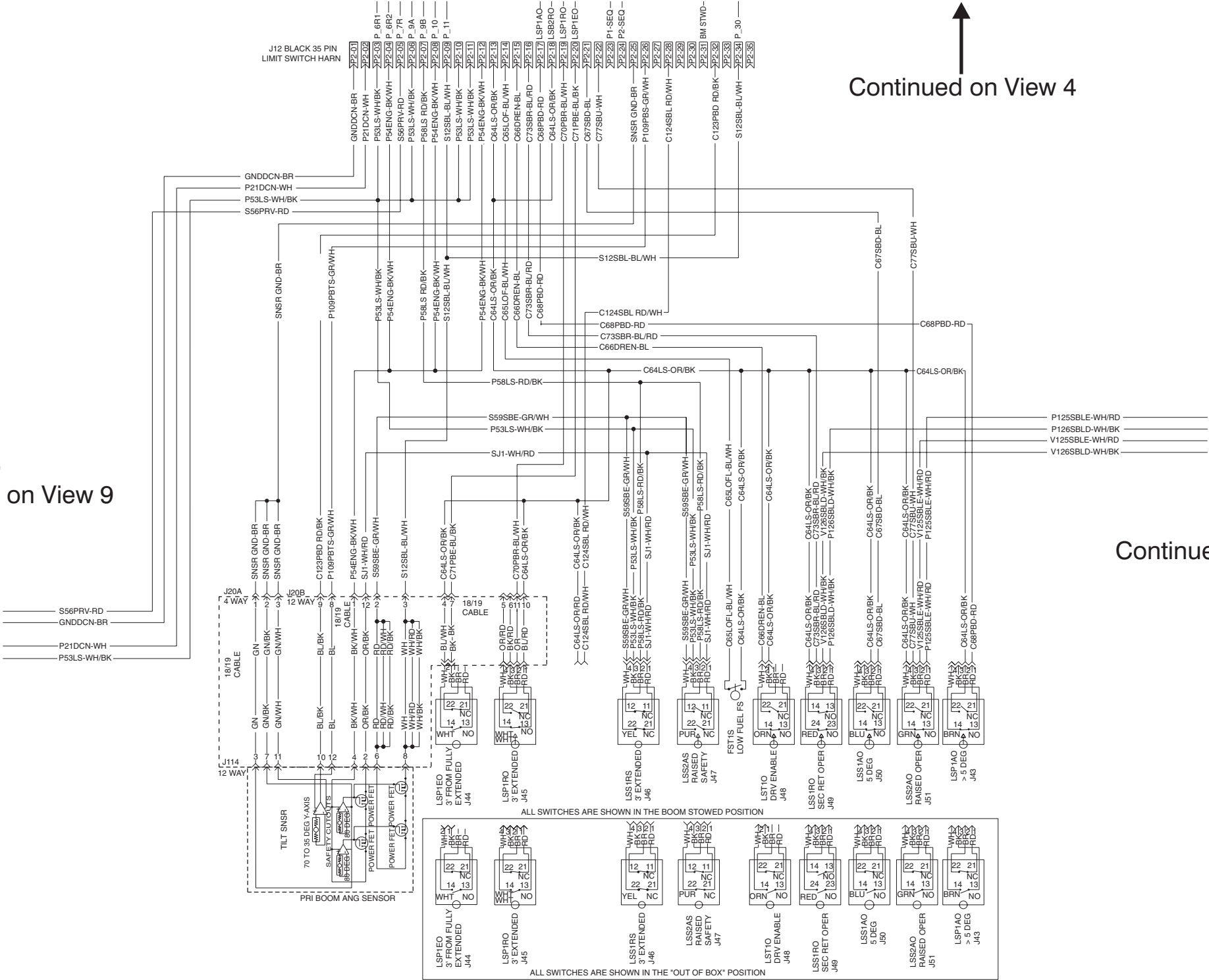
Electrical Schematic - View 10
Limit Switches

N M L K J I H G F E D C B A

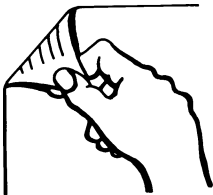
Continued on View 9

Continued on View 4

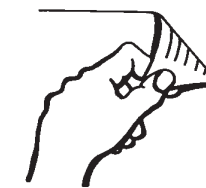
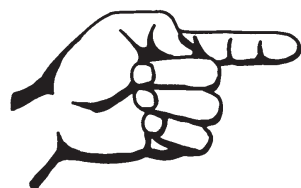
Continued on View 11



Electrical Schematic - View 10
Limit Switches

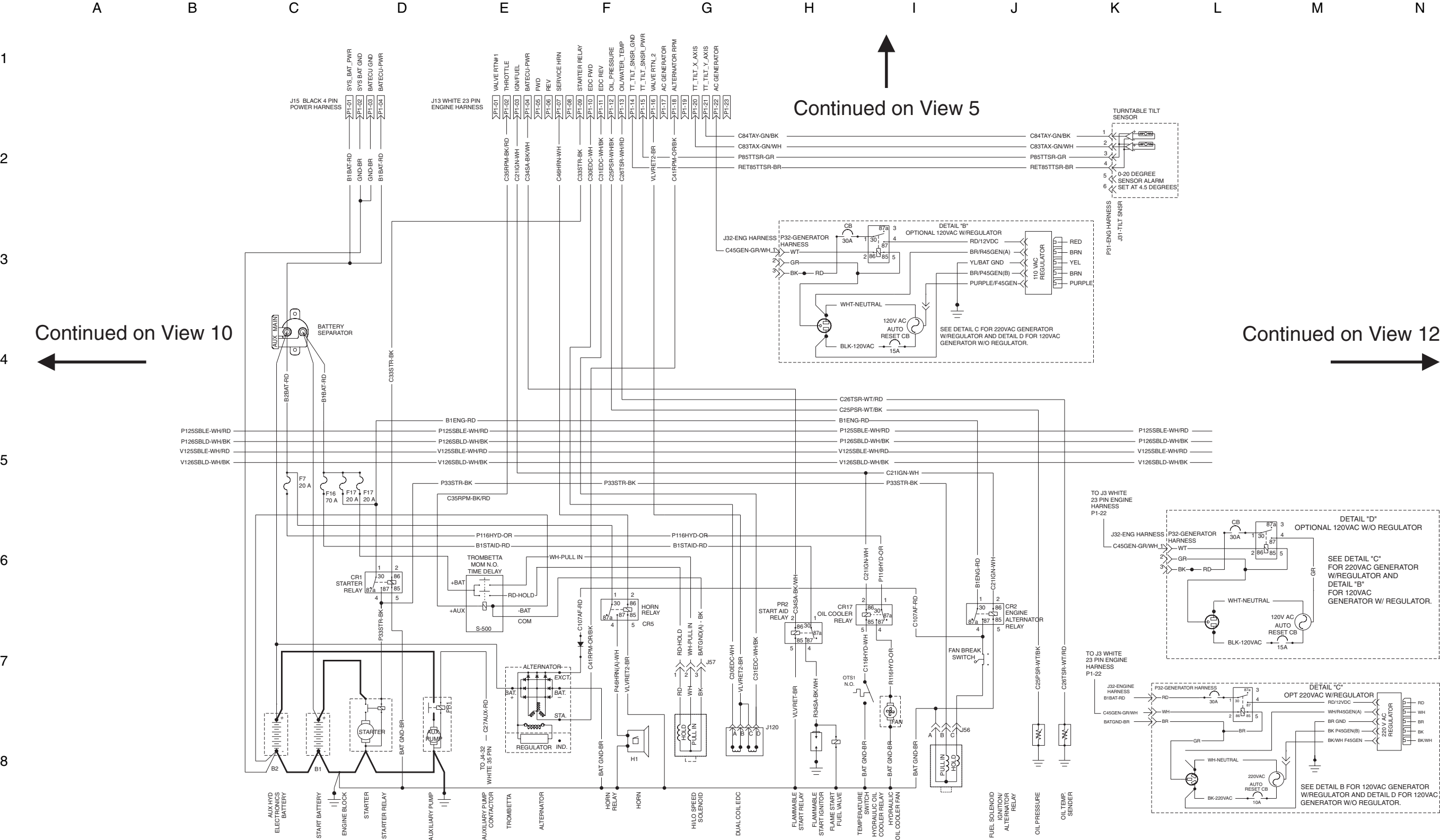


Electrical Schematic - View 11
Deutz F4L-913 Engine (before serial number 339)



Electrical Schematic - View 11
Deutz F4L-913 Engine (before serial number 339)

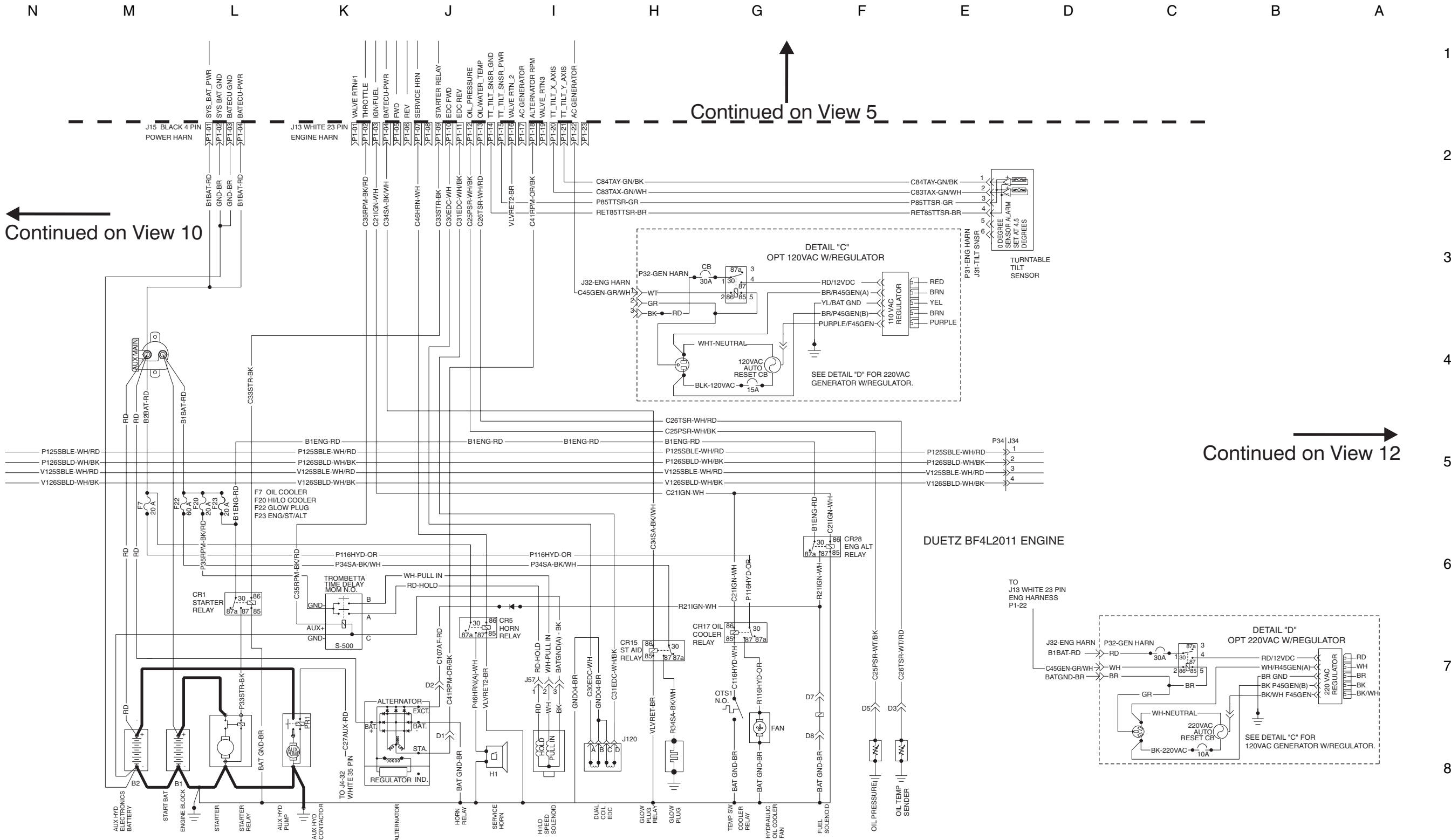
REV B



REV A

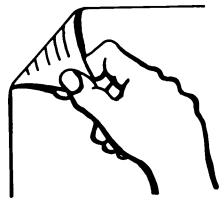
Electrical Schematic - View 11

Deutz BF4L-2011 Engine (after serial number 338)

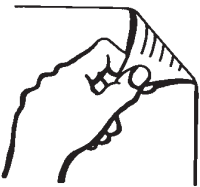
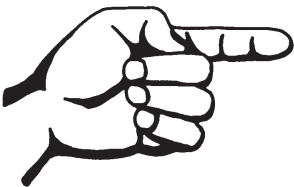


Electrical Schematic - View 11

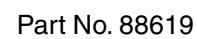
Deutz BF4L-2011 (after serial number 338)



Electrical Schematic - View 12

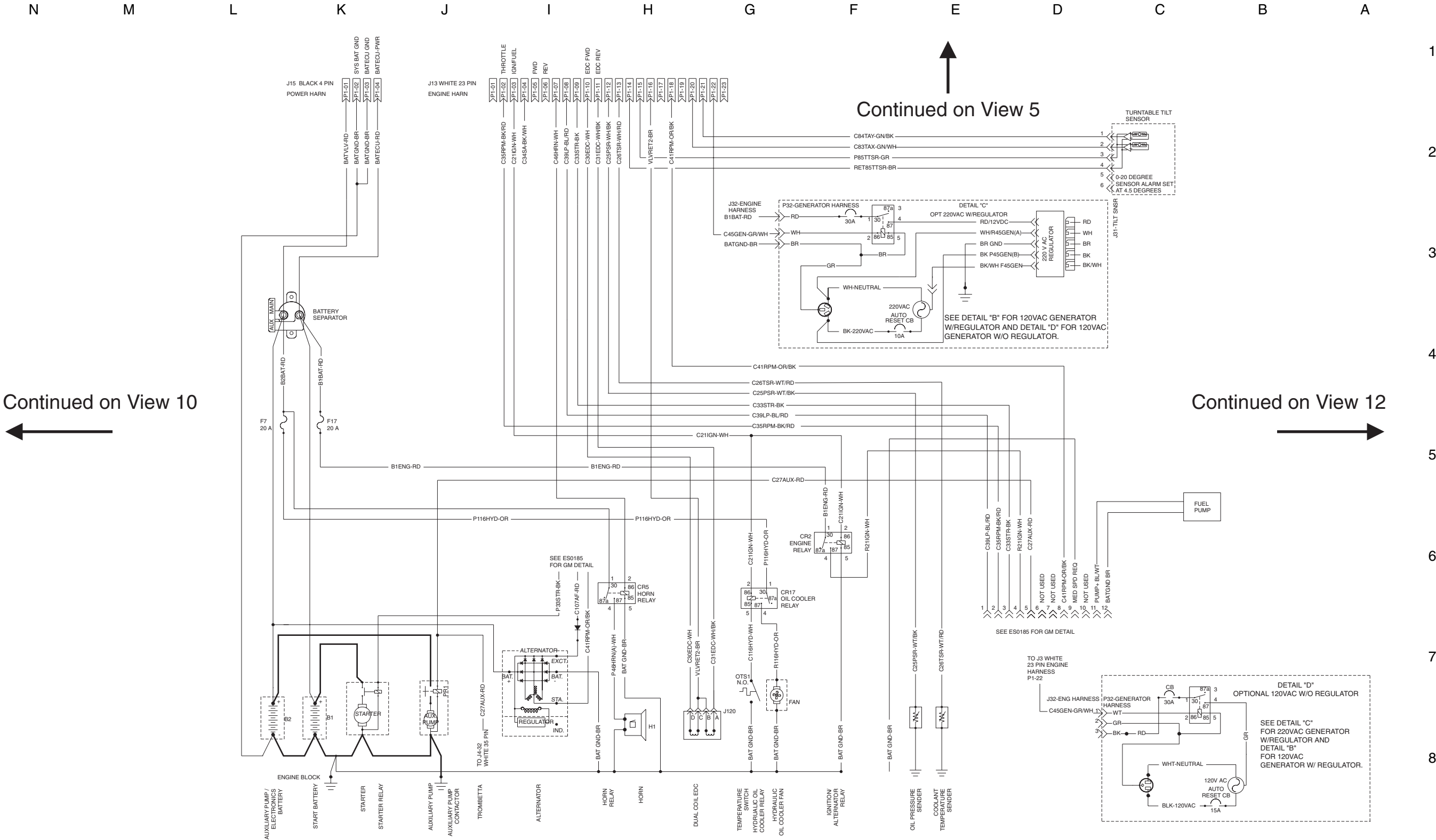


REV C

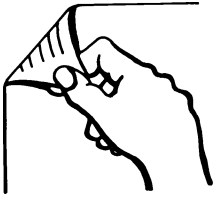


REV C

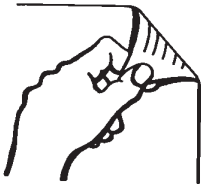
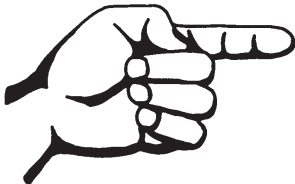
Electrical Schematic - View 13
GM 3.0L Engine



Electrical Schematic - View 13
GM 3.0L Engine

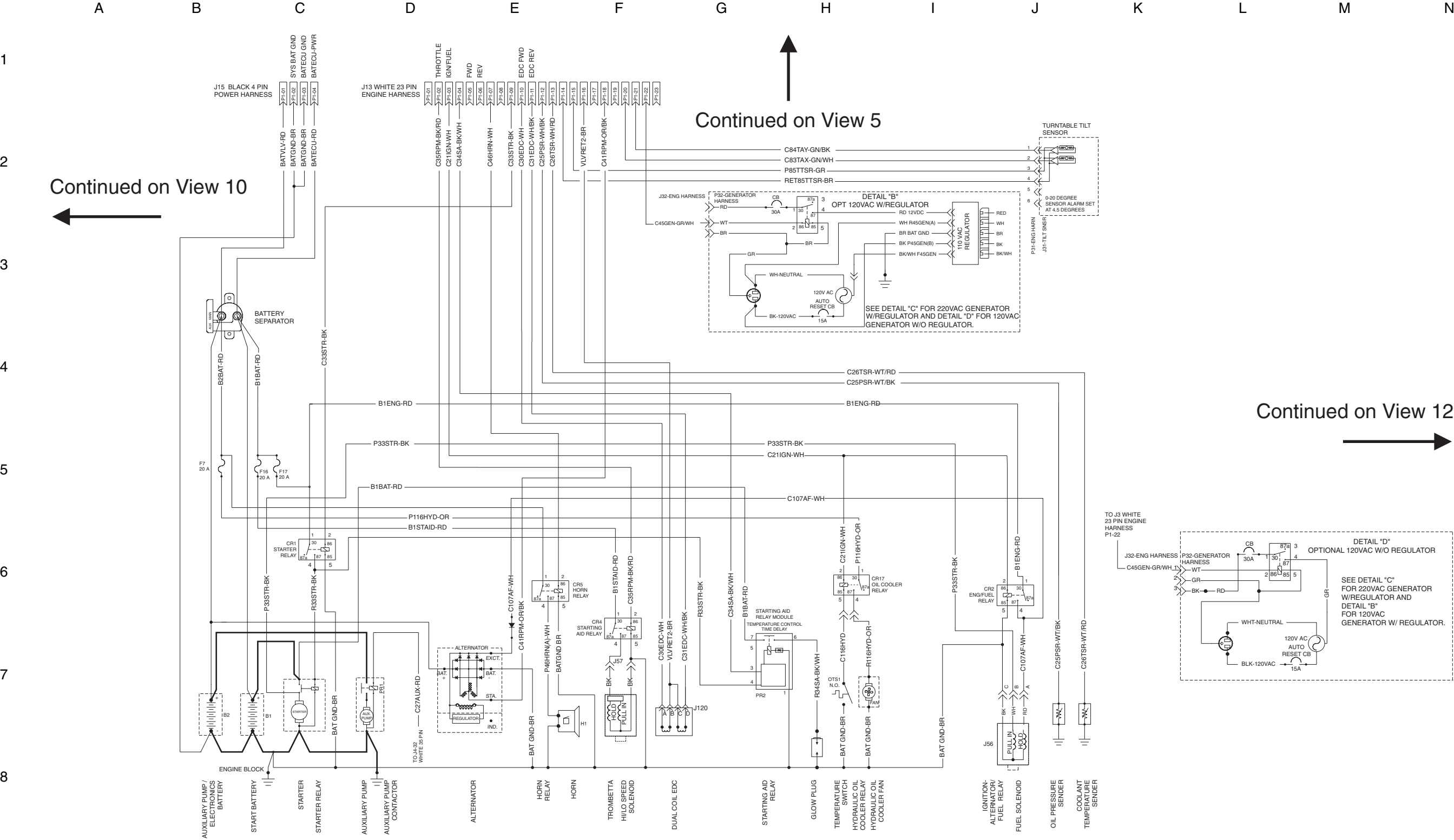


Electrical Schematic - View 14
Perkins 704-30 Engine (before serial number 329)



Electrical Schematic - View 14
Perkins 704-30 Engine (before serial number 329)

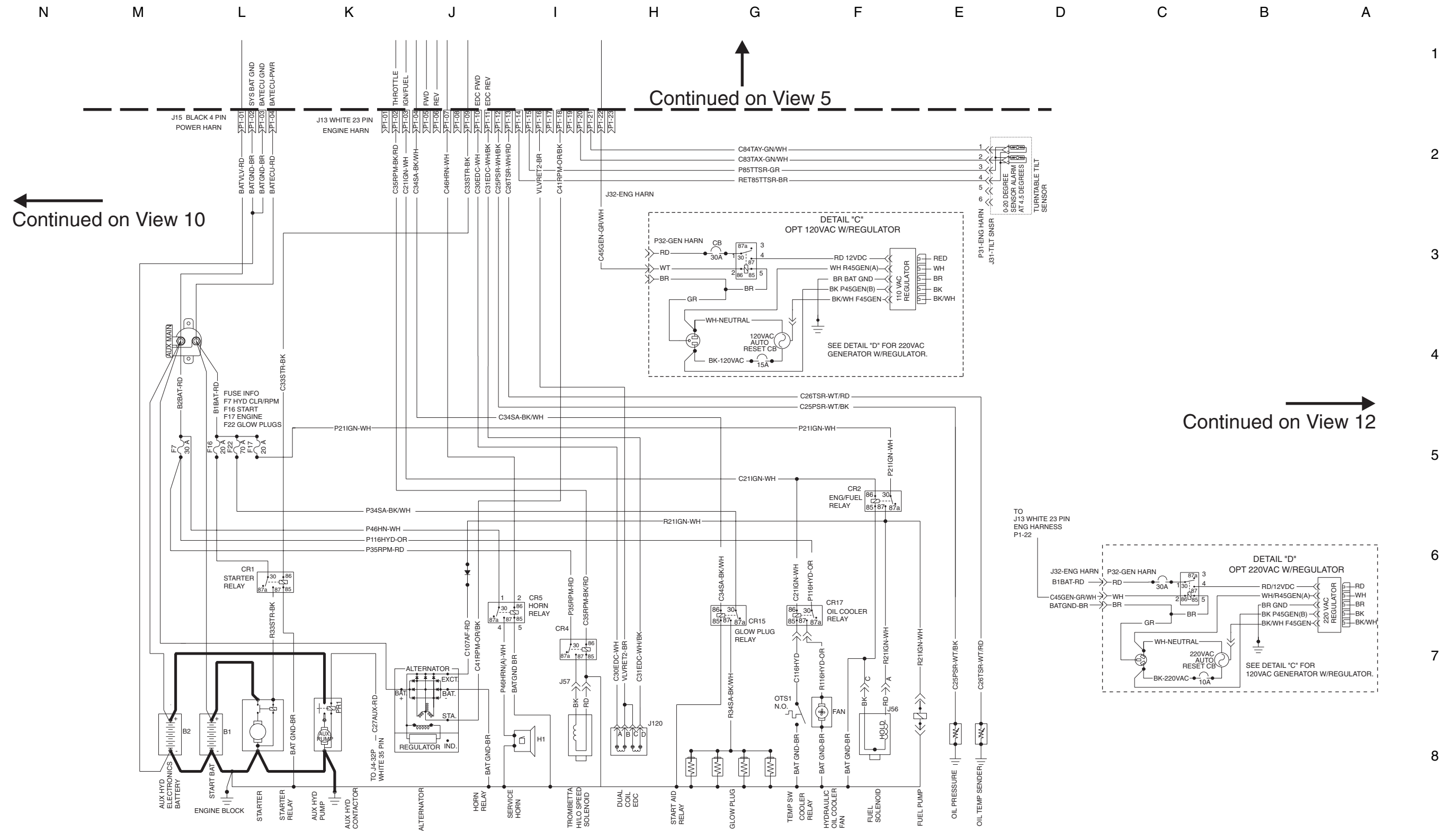
REV B



REV A

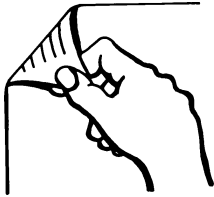
Electrical Schematic - View 14

Perkins 804C-33 Engine (after serial number 328)

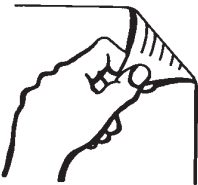
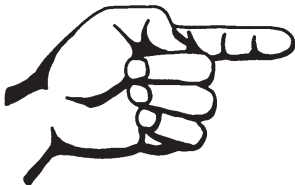


Electrical Schematic - View 14

Perkins 804C-33 Engine (after serial number 328)



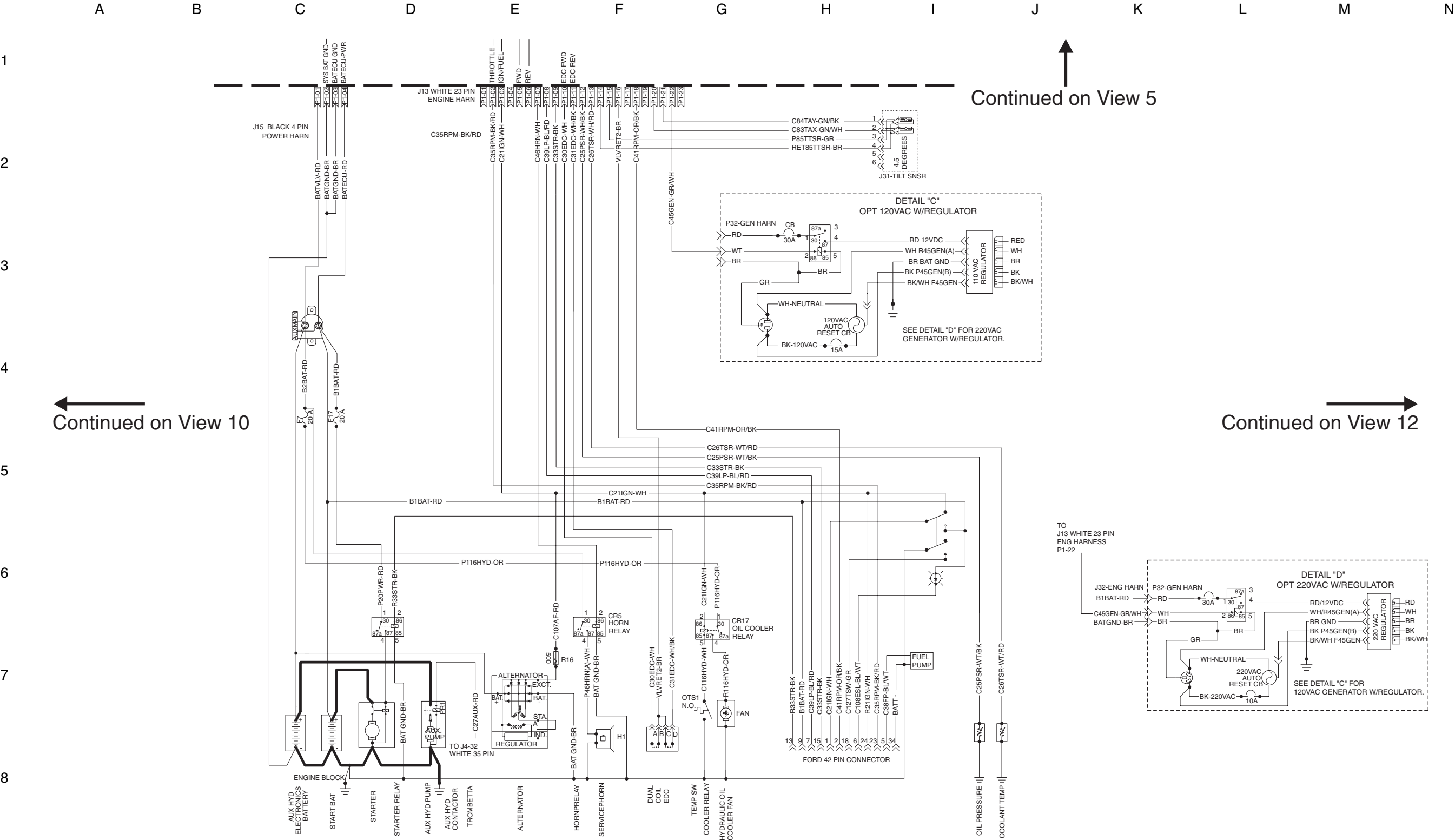
Electrical Schematic - View 15
Ford LRG 425 Engine



Electrical Schematic - View 15

Ford LRG 425 Engine

REV A



REV A

Electrical Schematic - View 16

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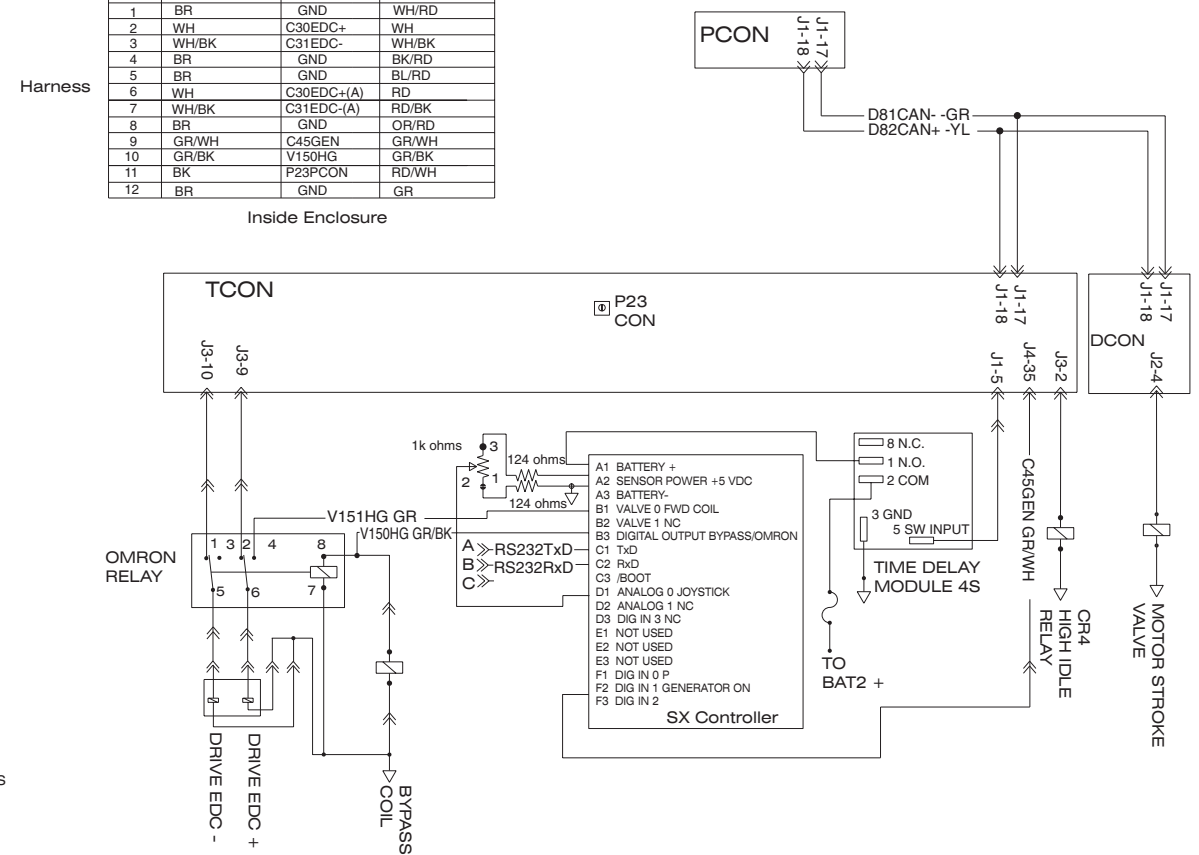
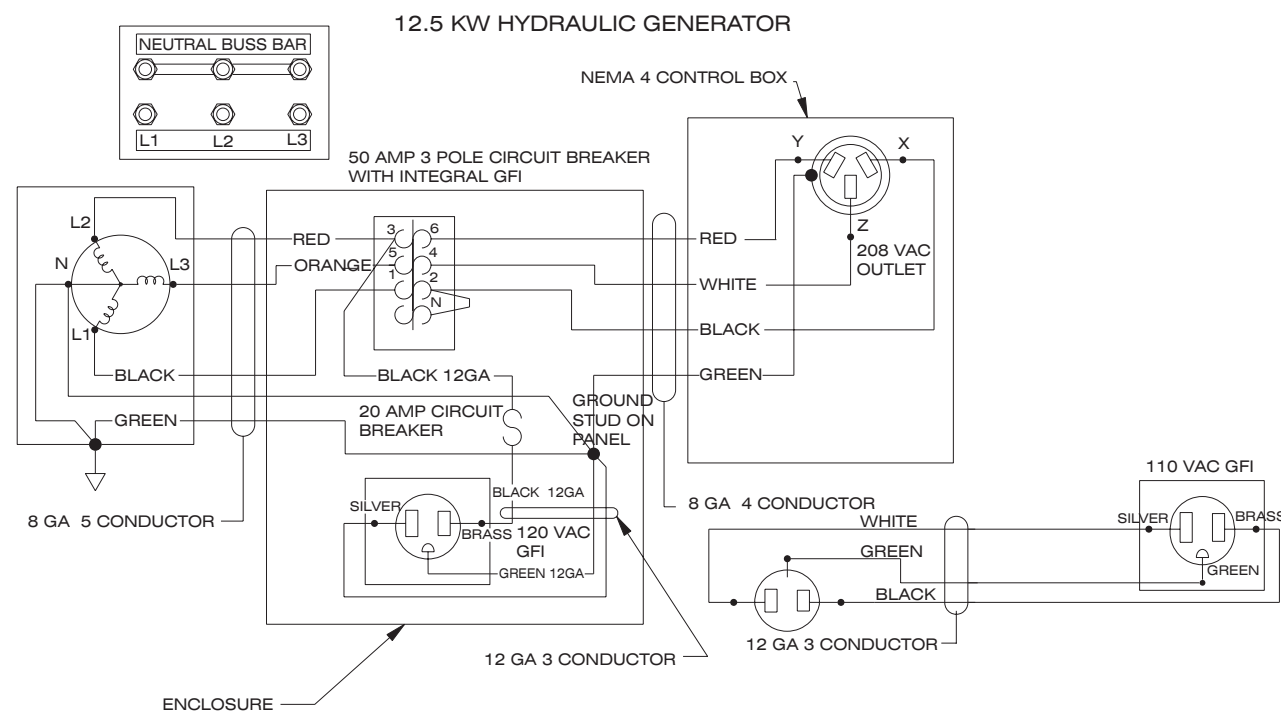
C

B

A

PIN#	COLOR	CKT#	COLOR
1	BR	GND	WH/RD
2	WH	C30EDC+	WH
3	WH/BK	C31EDC-	WH/BK
4	BR	GND	BK/RD
5	BR	GND	BL/RD
6	WH	C30EDC+(A)	RD
7	WH/BK	C31EDC-(A)	RD/BK
8	BR	GND	OR/RD
9	GR/WH	C45GEN	GR/WH
10	GR/BK	V150HG	GR/BK
11	BK	P23PCON	RD/WH
12	BR	GND	GR

Inside Enclosure



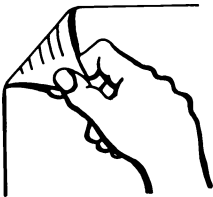
Theory of Operation

1. A request from PCON to turn the Generator on commands TCON to enable the High RPM output and the generator output. DCON enables the motor stroke valve switching the motors to high speed/low torque mode.
2. The SX controller is turned ON supplying power to bypass valve and the change over relay. The EDC valve is switched over to the output of the SX controller.
3. When the AC generator is turned OFF the SX module will ramp the output to the EDC to threshold preventing cavitation to the hydraulic motor powering the generator. When threshold is reached the bypass valve is turned OFF.
4. The generator output is turned off when an operator engages the footswitch. The propel function has a time delay to ensure the SX controller ramps the drive pump off and disengages the dump valve.

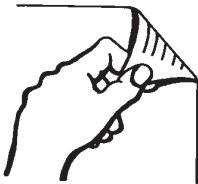
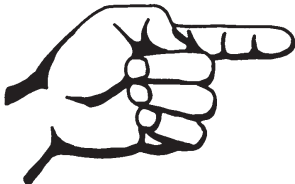
Adjustments

1. Connect a digital multimeter (DMM) with a frequency counter to the 110 vac outlet. Adjust the potentiometer until a frequency of 66.5 HZ is obtained with no load on the generator.

Electrical Schematic - View 16
Hydraulic Generator Option



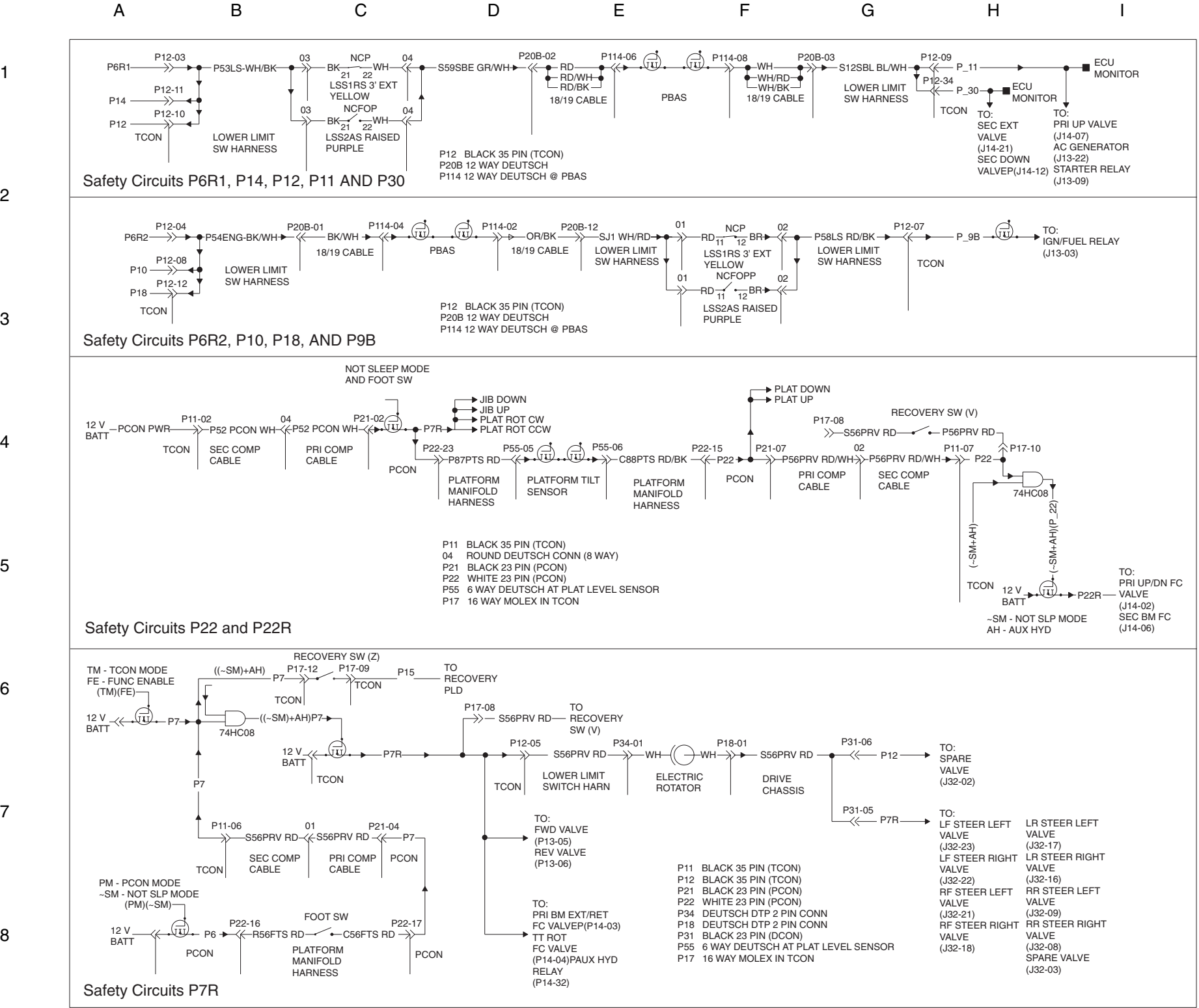
Electrical Schematic - View 17
Safety Circuits



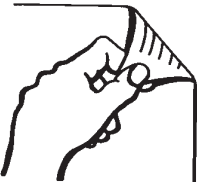
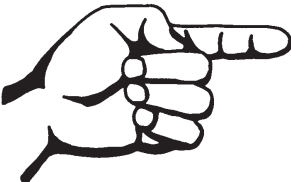
Electrical Schematic - View 17

Safety Circuits

REV C



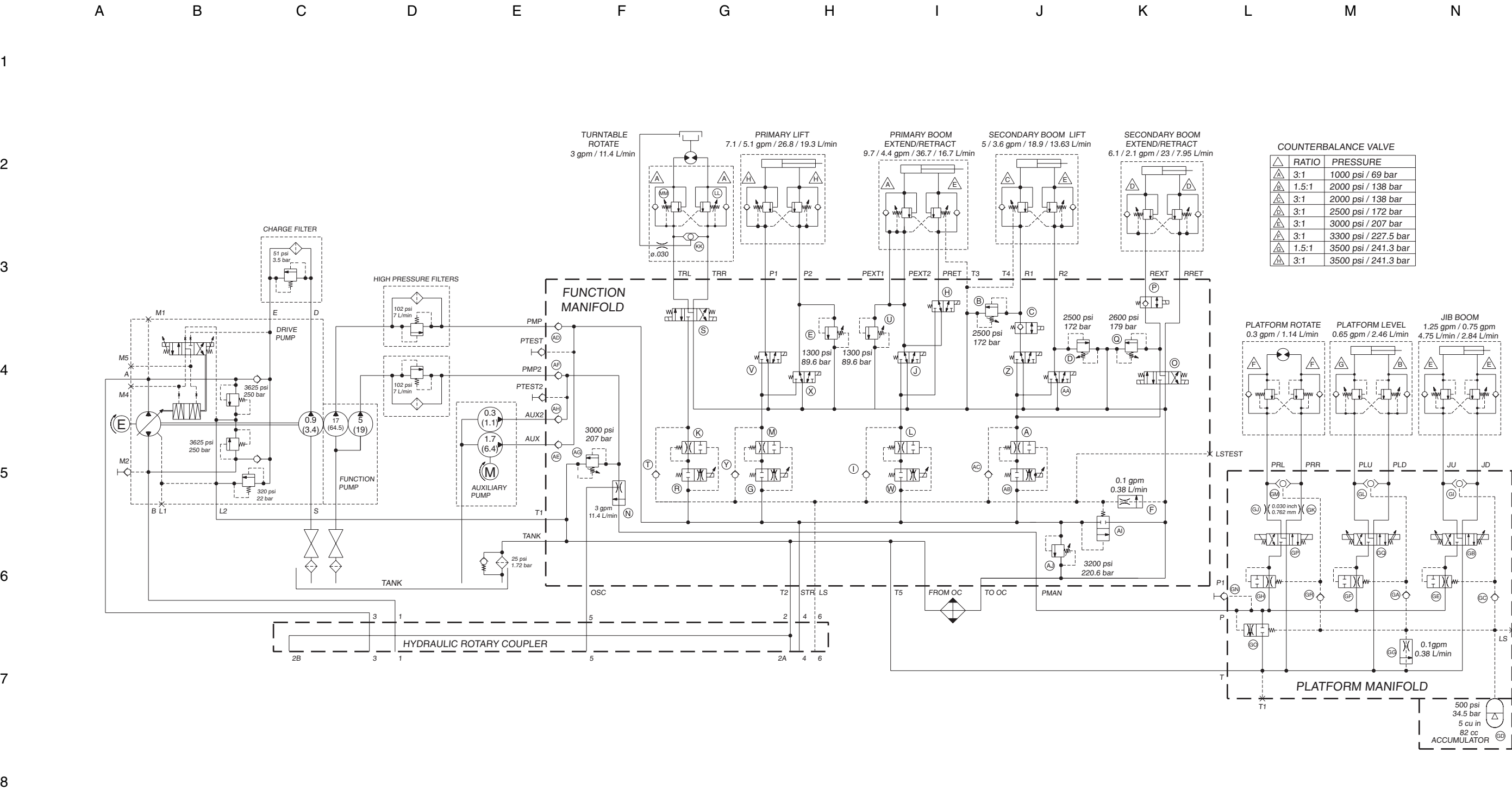
Hydraulic Schematic
2 Wheel Drive with 2 Wheel Steer - View 1



Hydraulic Schematic

2 Wheel Drive with 2 Wheel Steer - View 1

REV C



REV C

Hydraulic Schematic

2 Wheel Drive with 2 Wheel Steer - View 2

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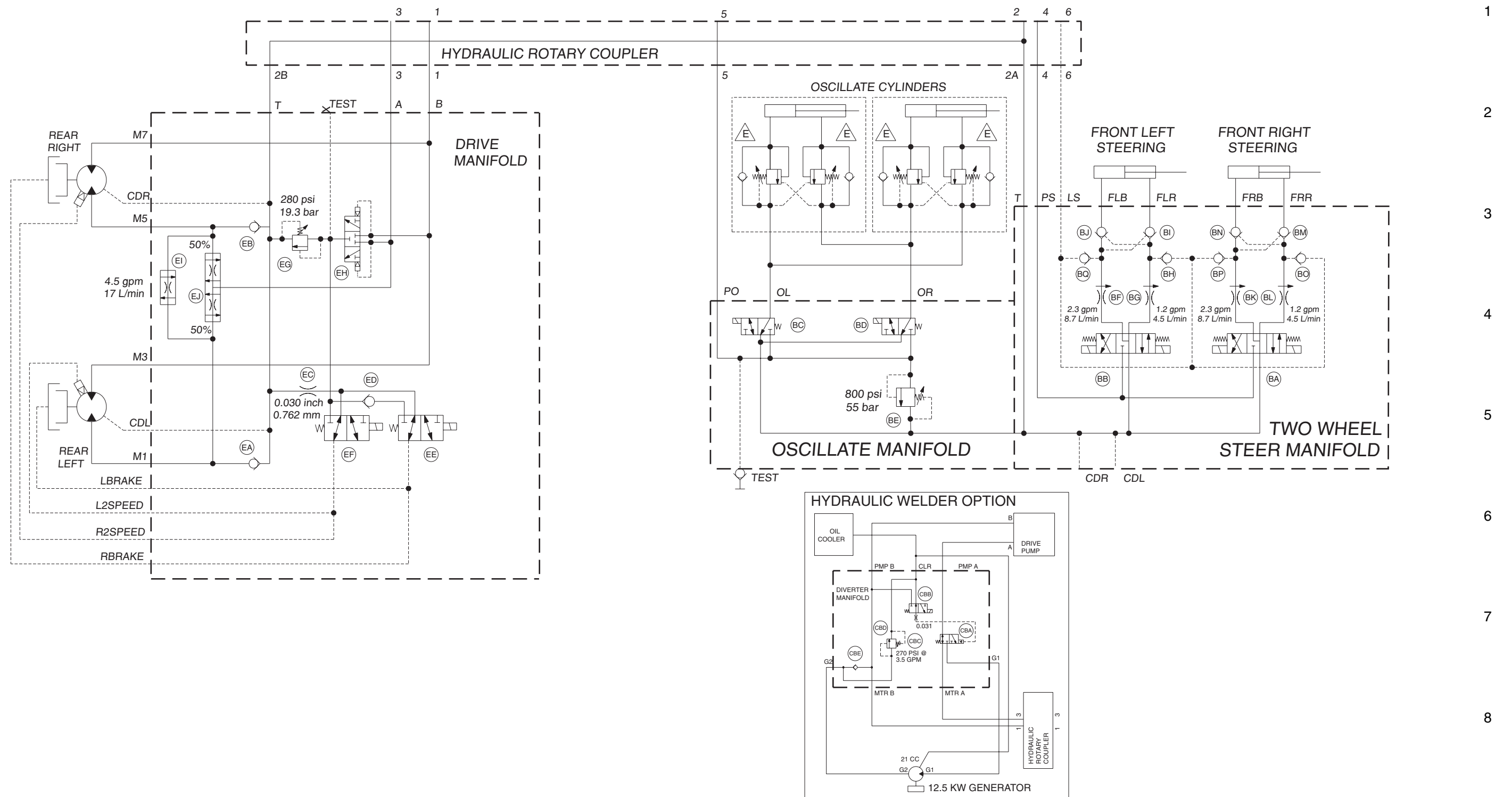
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B

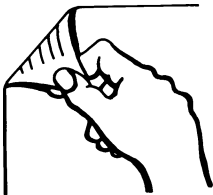
A



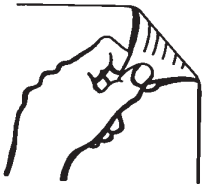
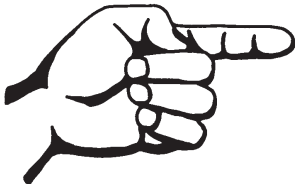


Hydraulic Schematic

2 Wheel Drive with 2 Wheel Steer - View 2



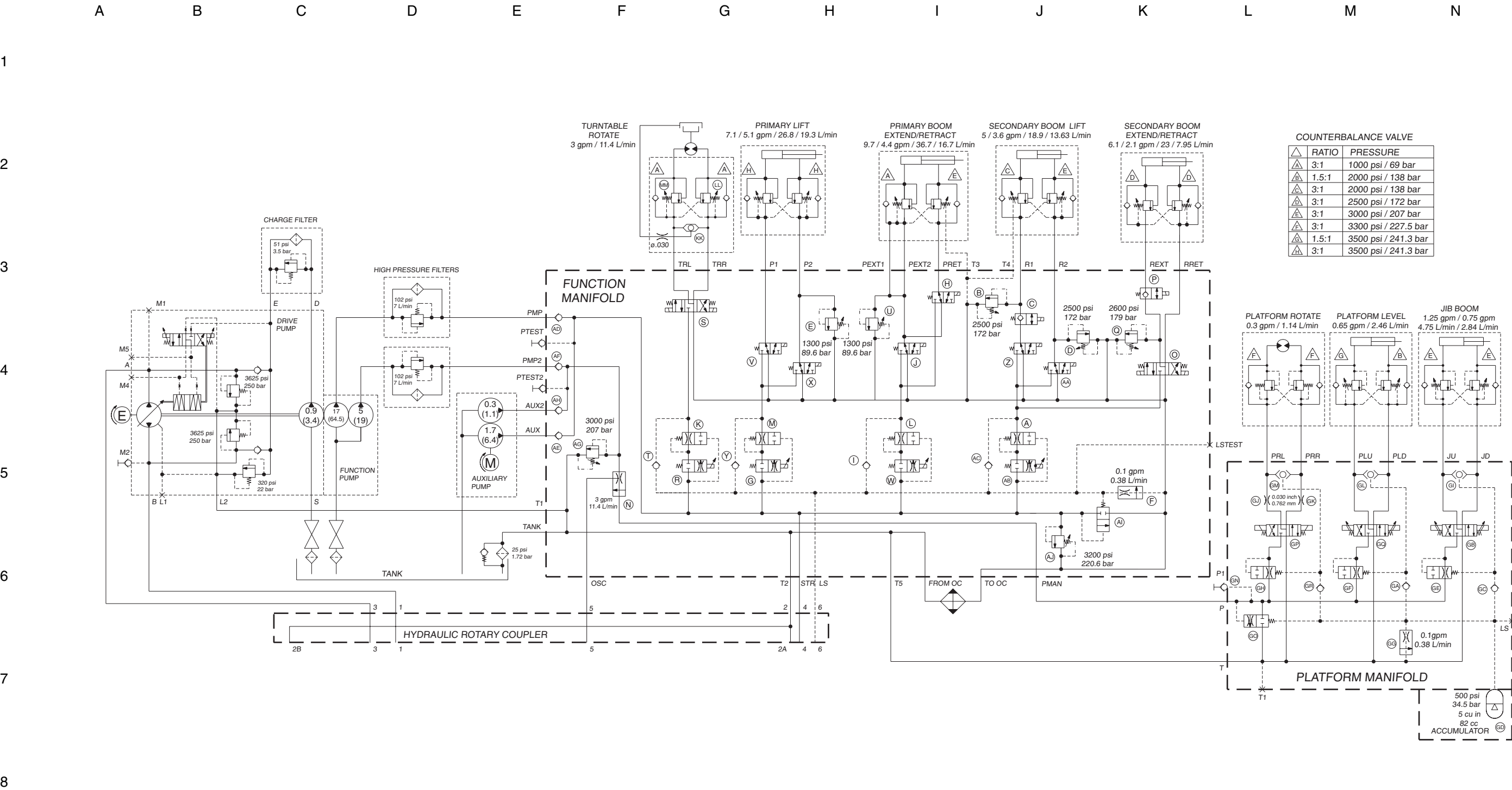
Hydraulic Schematic
2 Wheel Drive with 4 Wheel Steer - View 1



Hydraulic Schematic

2 Wheel Drive with 4 Wheel Steer - View 1

REV C



REV C

Hydraulic Schematic

2 Wheel Drive with 4 Wheel Steer - View 2

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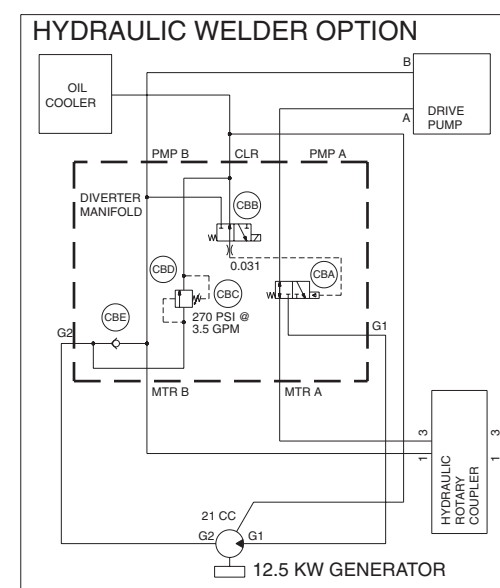
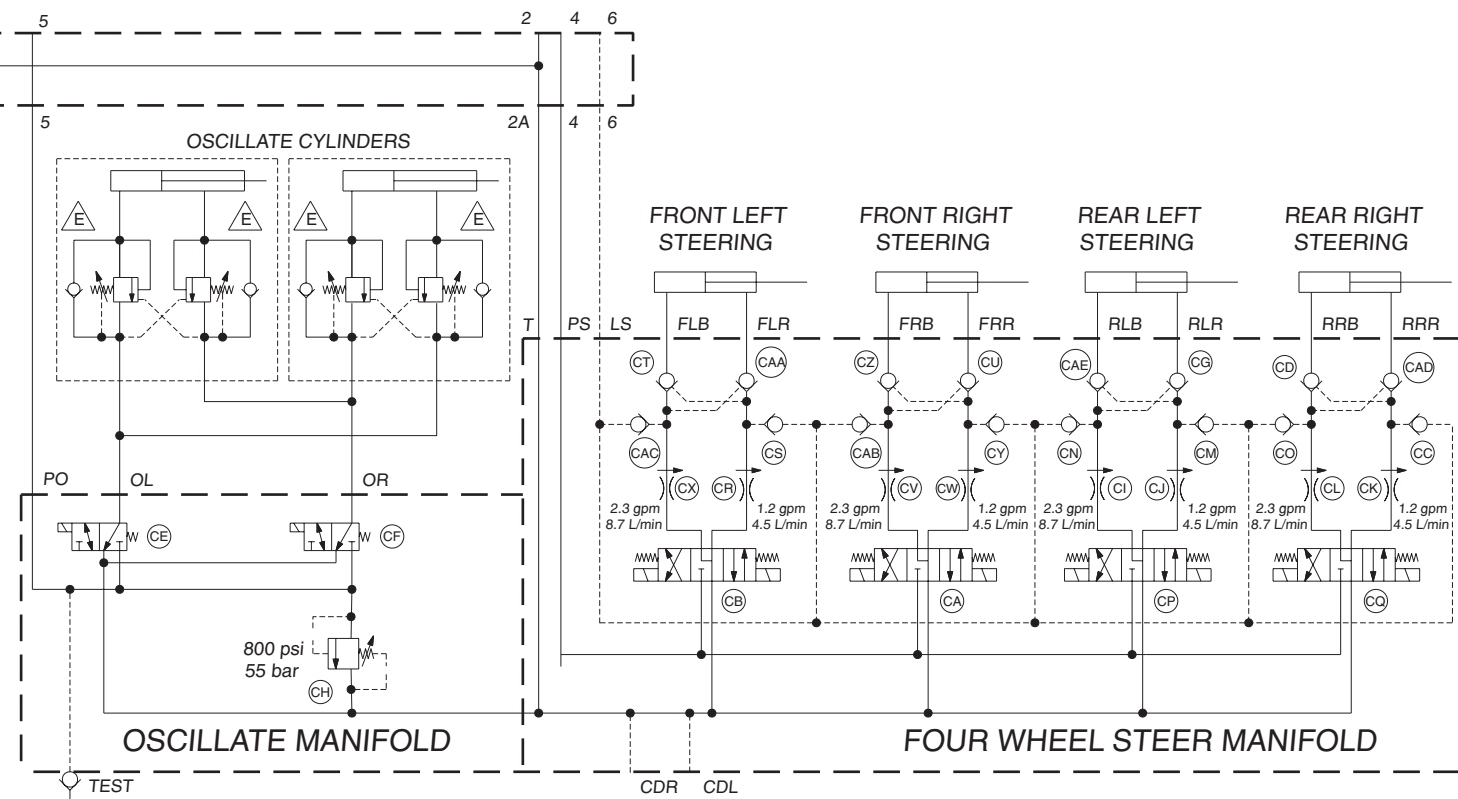
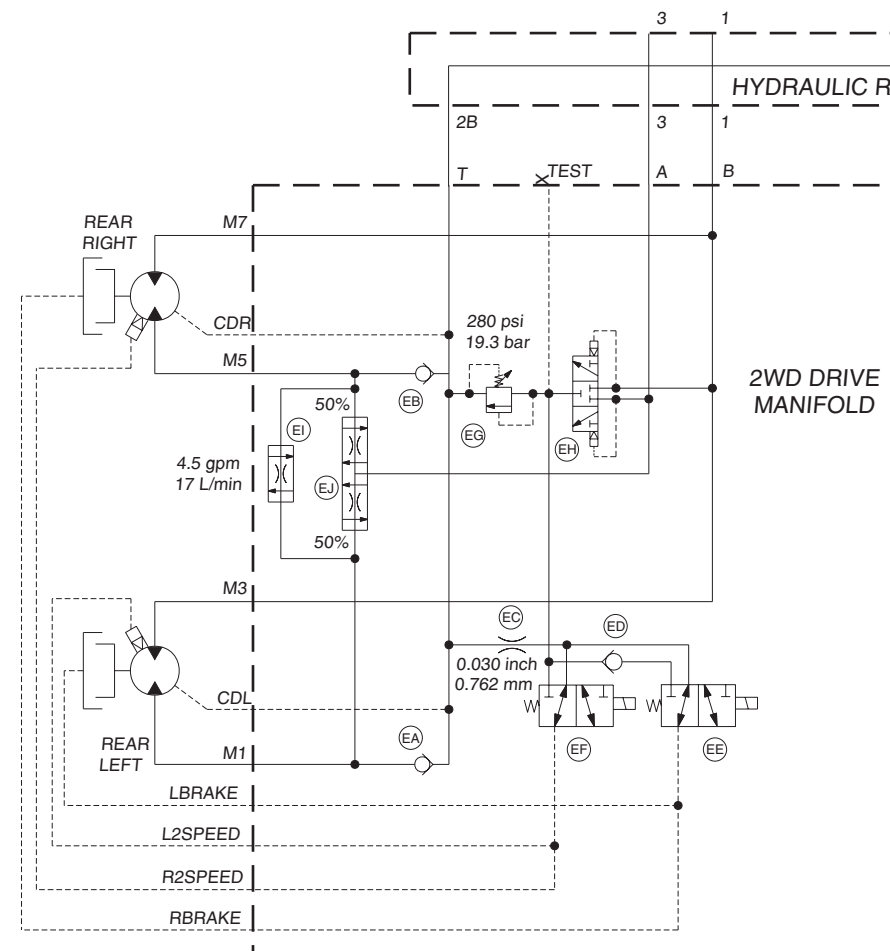
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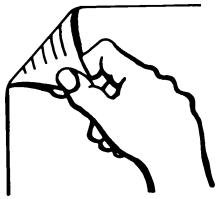
C

B

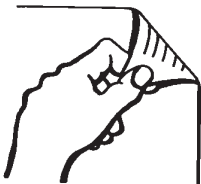
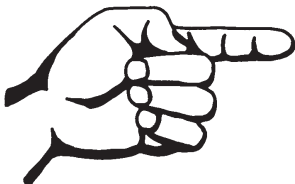
A



Hydraulic Schematic
2 Wheel Drive with 4 Wheel Steer - View 2



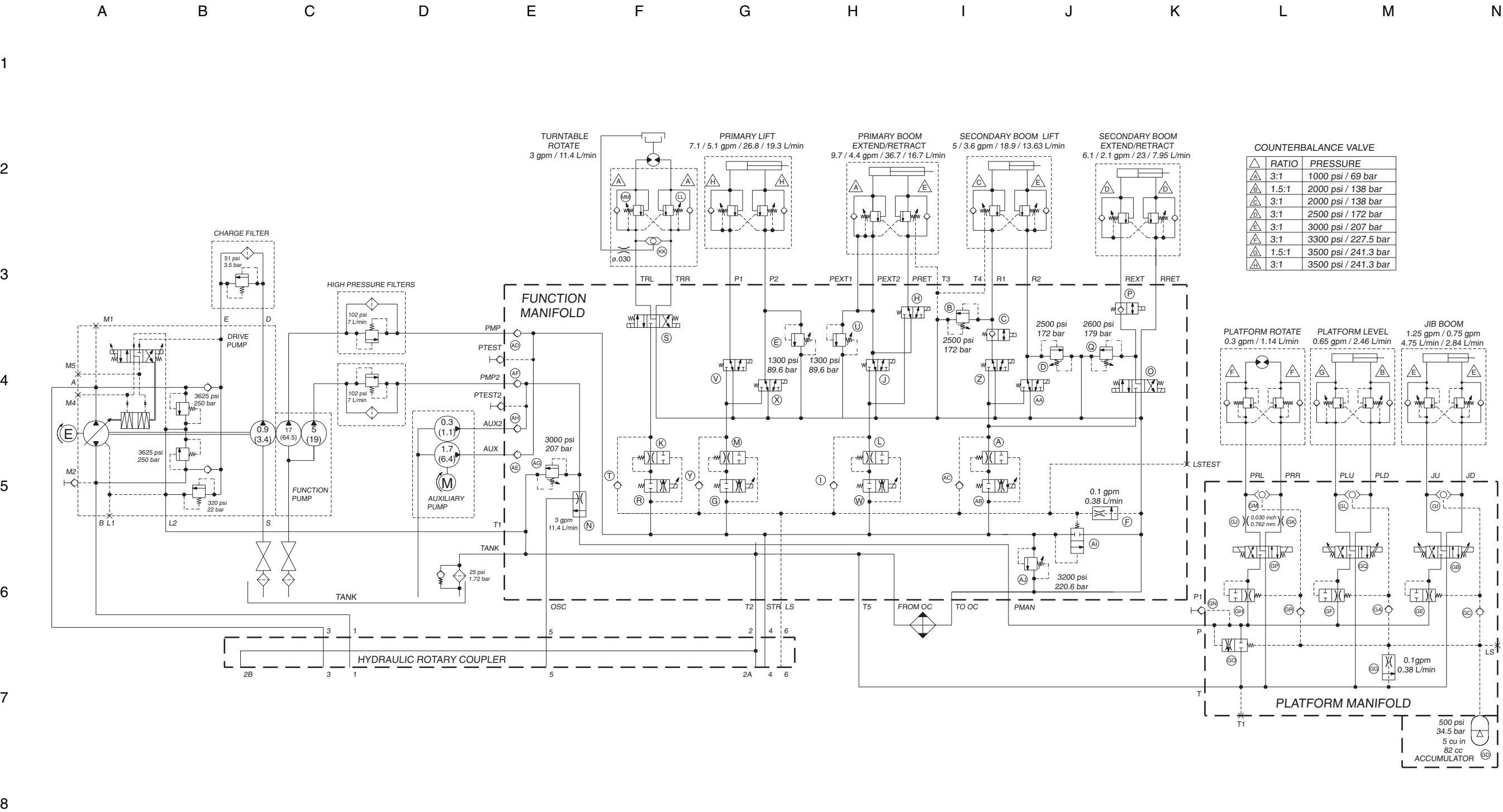
Hydraulic Schematic
4 Wheel Drive with 2 Wheel Steer - View 1



Hydraulic Schematic

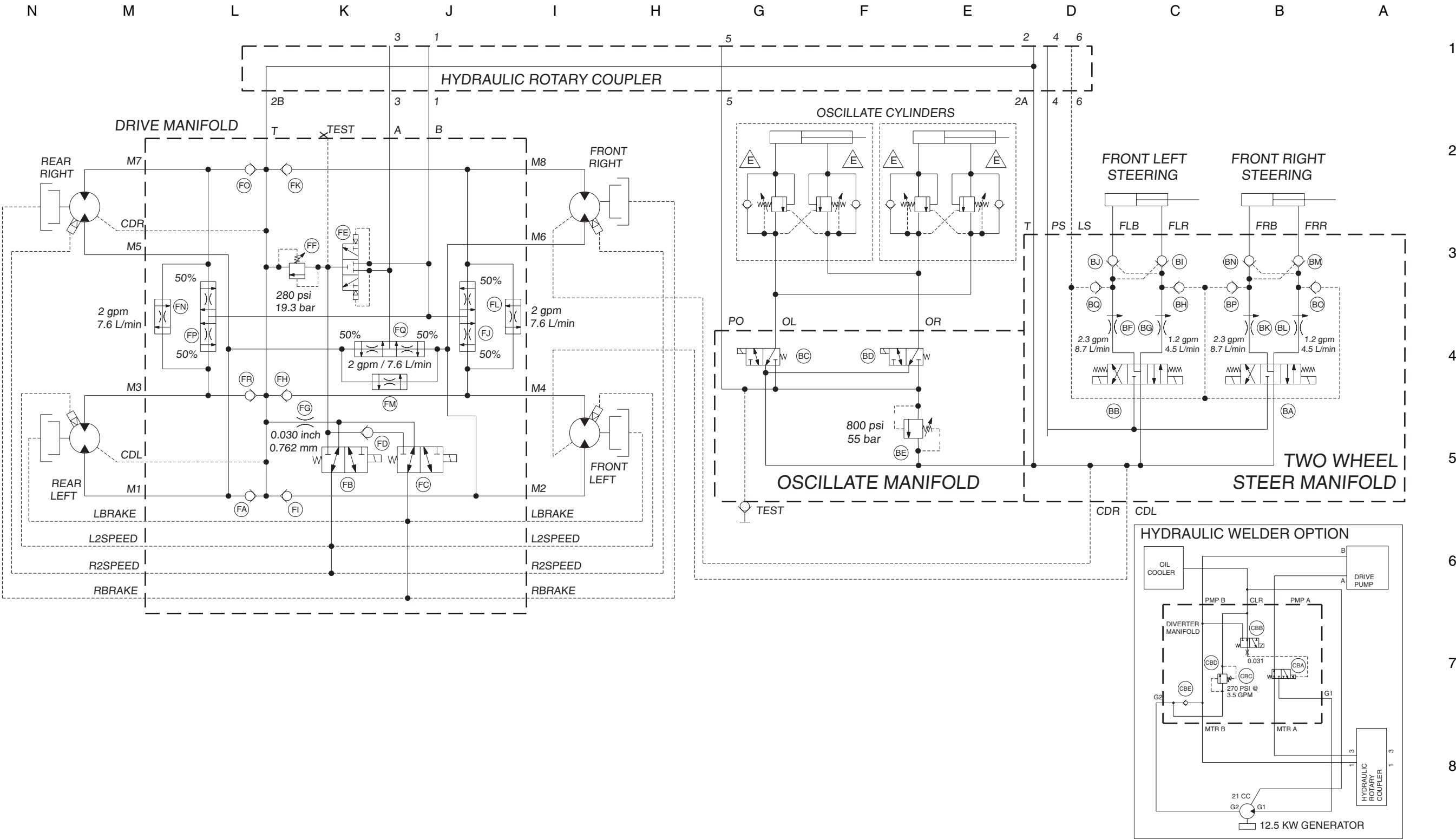
4 Wheel Drive with 2 Wheel Steer - View 1

REV C

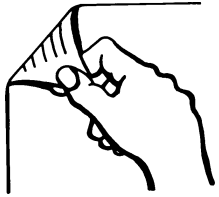


REV C

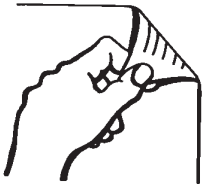
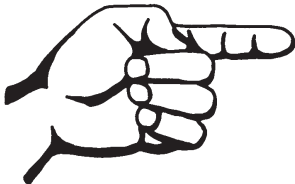
Hydraulic Schematic
4 Wheel Drive with 2 Wheel Steer - View 2



Hydraulic Schematic
4 Wheel Drive with 2 Wheel Steer - View 2



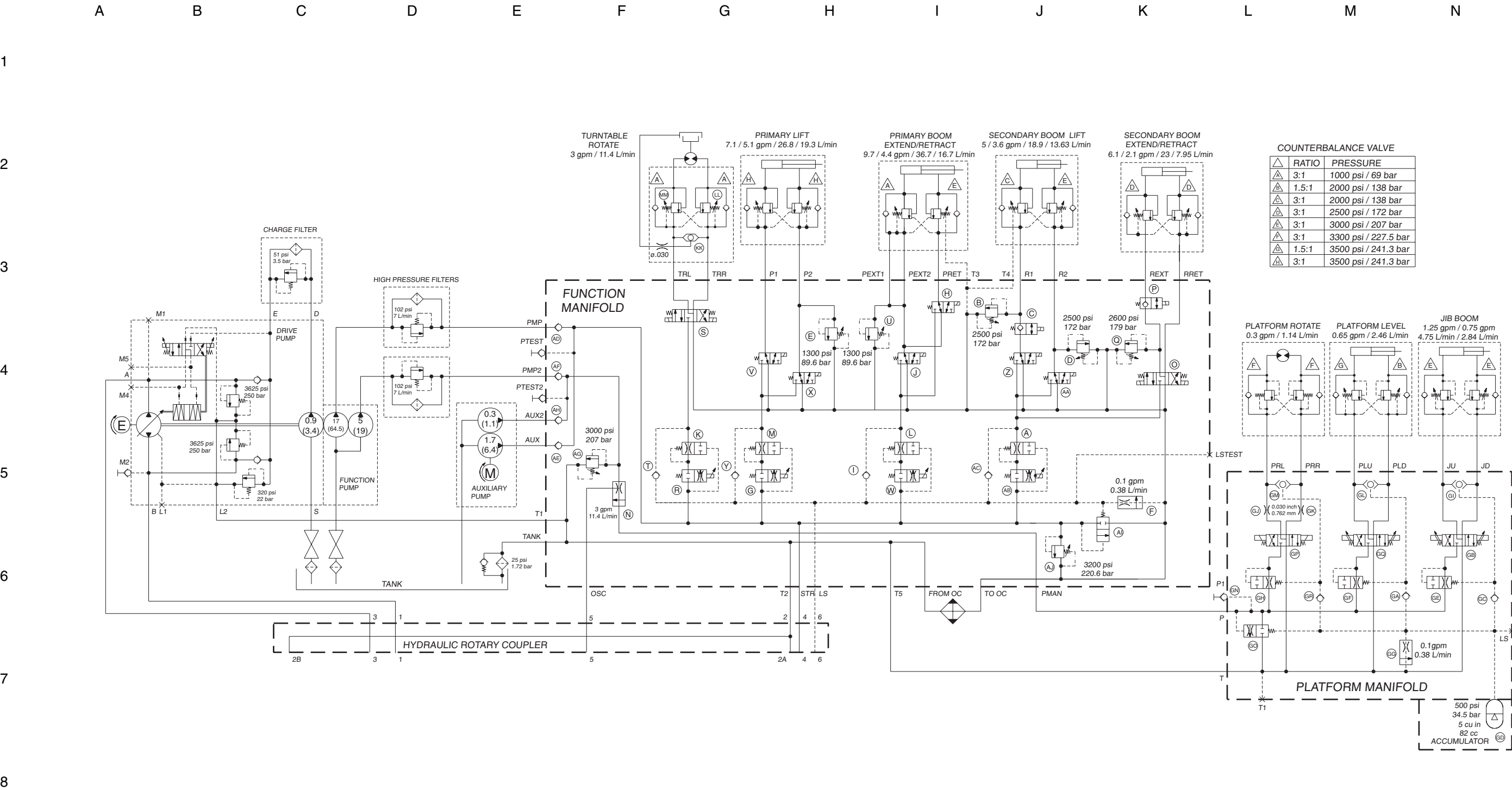
Hydraulic Schematic
4 Wheel Drive with 4 Wheel Steer - View 1



Hydraulic Schematic

4 Wheel Drive with 4 Wheel Steer - View 1

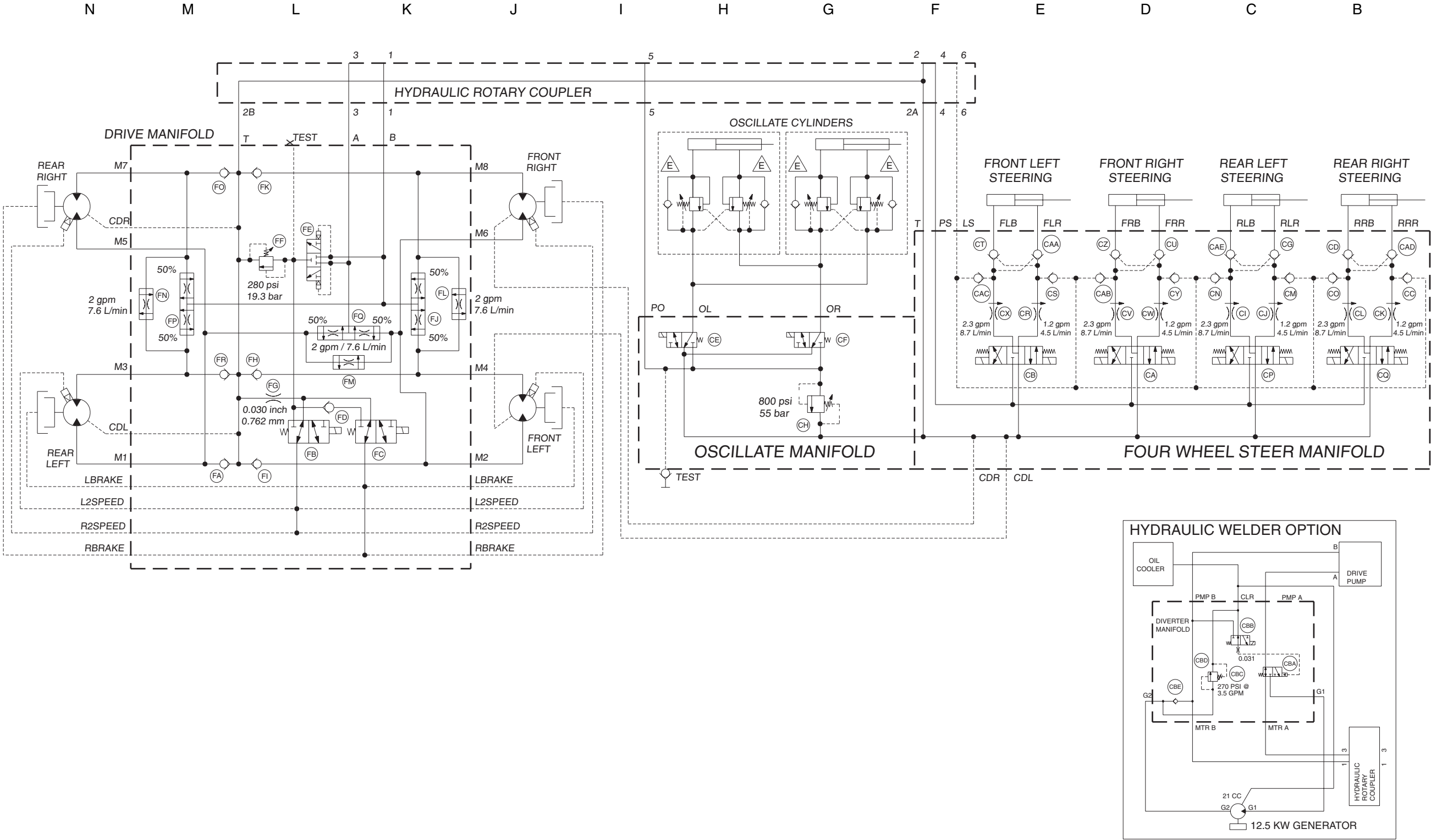
REV C



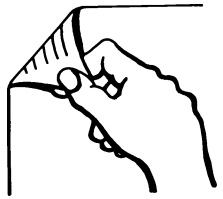
REV C

Hydraulic Schematic

4 Wheel Drive with 4 Wheel Steer - View 2



Hydraulic Schematic
4 Wheel Drive with 4 Wheel Steer - View 2



California Proposition 65

WARNING

The exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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